

SP-300 Series

maxon®

SERVICE MANUAL



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Part Number: 680-100-0155

April 2001

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SPECIFICATIONS

GENERAL

| | |
|-------------------------------------|--|
| Equipment Type | Hand portable |
| Band | UHF/ VHF |
| Channel Spacings | 12.5 kHz, 25 kHz programmable |
| RF Output Power | 5/ 1 watt |
| Modulation Type | F3E |
| Audio Power | 400 mW (Ext with 8 ohm) 400 mW (Int with 2 ohm) |
| Intermediate Frequency | 45.1 MHz & 455 kHz |
| Number of Channels | 16/ 4 |
| Frequency Source | Synthesizer |
| Operation Rating | Intermittent 90 : 5 : 5 (Standby: RX: TX) |
| Power Supply | Rechargeable Nickel-metal Hydride Battery, 7.5 VDC +/- 10 % |

TEMPERATURE RANGE

| | |
|------------------------|-------------------------|
| Storage | From - 40° C to + 80° C |
| Operating | From - 30° C to + 60° C |

CURRENT CONSUMPTION

| | |
|--|---|
| Off | < 1 mA |
| Standby (Muted) | < 30 mA (Battery Save On) < 60 mA (Battery Save Off) |
| Unmuted, 100 % Max AF Power | < 500 mA |
| Transmit 5 Watt RF Power | < 2.4 A |

BATTERY LIFE (5-5-90% Duty Cycle)

| | |
|-----------------------|-------------|
| 1350 mAh | 9 Hrs @ 5 W |
|-----------------------|-------------|

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FREQUENCY BANDS

| | RX | TX |
|---------|-----------------------|-----------------------|
| VHF: V2 | 148.000 - 174.000 MHz | 148.000 - 174.000 MHz |
| UHF: U2 | 440.000 - 470.000 MHz | 440.000 - 470.000 MHz |

DIMENSIONS

Radio (141mm)H x (58 mm)W x (37 mm)D

WEIGHT

Radio 225 grams

With 1350 mAh Battery 425 grams

TRANSMITTER

Carrier Power High: 5.0W
Low: 1.0W

AUDIO FREQUENCY DEVIATION

Without Subaudio Tone Modulation:

25 kHz Channel Spacing Max. ± 5.0 kHz

12.5 kHz Channel Spacing Max. ± 2.5 kHz

With Subaudio Tone Modulation @ 10 % Peak Deviation

25 kHz Channel Spacing Max. ± 5.0 kHz

12.5 kHz Max. ± 2.5 kHz

Audio Frequency Response Within $\pm 1/-3$ dB of 6dB octave

ADJACENT CHANNEL POWER

25 kHz < 70 dBc

12.5 kHz < 60 dBc

Conducted Spurious Emission < -60 dBc

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Transmitter Audio Distortion (Without CTCSS) < 5% @ 1 kHz

Hum & Noise:

12.5 kHz Channel Spacing > 40 dB (with PSOPH)

25 kHz Channel Spacing > 40 dB (with no PSOPH)

Load Stability No osc at ³ 10:1 VSWR all phase angles
and suitable antenna

Peak Deviation @ 1 kHz (Nom. Dev +20dB)

25 kHz Channel Spacing Max. 5.0 kHz

12.5 kHz Channel Spacing Max. 2.5 kHz

RECEIVER

Sensitivity (12dB Sinad) UHF: < -117 dBm(.31μV)

VHF: < -118 dBm(.28μV)

Amplitude Characteristic < ±3 dB

Adjacent Channel Selectivity:

25 kHz Channel Spacing >60 dB

12.5 kHz Channel Spacing >50 dB

Spurious Response Rejection 70 dB

Intermodulation Response Rejection 65 dB

Temperature Stability 0.0005% (-30°C to +60°C)

Conducted and Radiated Spurious Emission Per FCC and IC Rules and Regulations

AF Distortion < 5%

Frequency Response 6 dB/octave de-emphasized response in
the range 300 Hz - 3000 Hz

RX Hum & Noise:

25 kHz < 40 dB

12.5 kHz < 40 dB

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RX TONE DEMODULATION CHARACTERISTICS

SUBAUDIO TONES - CTCSS

Tone Range 67 Hz to 250.3 Hz

Non-Standard Tones 50 Hz to 260 Hz

Due to continuing research and development the company reserves the right to alter these specifications without prior notice.

INTRODUCTION

The SP-300 Series of portable radios from Maxon, utilizes the latest technology in its design and manufacturing. Both the VHF and UHF models are PLL (Phase Lock Loop Synthesizer) / microprocessor controlled, and offer 1 or 5 watts of power with 4 & 16 channel capability. Multiple functions including Scan, CTCSS / DCS signaling and 12.5 & 25 kHz channel spacing are standard in these fully programmable wide bandwidth handheld units.

FEATURES

Main Features

- *Wideband*
- *Scan Mode*
- *Busy Channel Lockout/Marked Idle Enable*
- *Standard/Non-Standard CTCSS/DCS Signaling*
- *Transmit Time-Out Timer/Tx Inhibit*
- *Beep Tone Enable/Disable*
- *Low Battery Indication*
- *Memory Protect*
- *External Option Detect*
- *5/1 Watts Programmable RF Power*
- *Battery Save Circuitry*
- *Locking Accessory Connector*

Wideband

This software is made to work and control the wide band receiver/transmitter boards.

Scan Mode

During programming of the radio, any channel can be selected as a scanned channel. When a channel is selected as a scanned channel, it becomes part of the scan list. The scan list will be activated by switching to the channel that was selected as the scan channel during programming of the system parameters.

The channel that was selected as the scan channel can still be used as a receive only channel when in scan mode or receive and transmit channel if the channel has been programmed for "Priority Scan TX".

Scan Channel Delete

When the unit is in scan mode the monitor button can be pushed to delete a channel from the scan list. If the monitor button is pushed while scanning has stopped to monitor an active channel, that channel will be deleted from the scan list. The channel will remain inactive in the scan list until the scan mode is re-initiated by switching off the scan list channel and switching back to the scan list channel. Any number of channels can be deleted from the scan list in this way. The scan list is always initiated with all the scan list channels active.

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A priority channel can be selected while programming the radio. A priority channel is a channel that can be periodically checked or looked back to while receiving on any channel in the scan list, or in normal operation. It can also be selected for all transmissions during scan mode.

To transmit on a channel in the scan list, the channel selector must be placed on the channel that the transmission is to be made on. As a system programmable option, it is possible to transmit on a scanned channel while the channel selector is on the scan list channel. This is the "Normal Scan TX" option. If this option is enabled the PTT can be pushed during the scan wait time and the transmission will be on the channel that was just activated. If this option is disabled, the transmission will be on the priority channel (if there is no priority channel programmed the transmission will be inhibited and out-of-lock indicator will be issued).

Any channel, whether it is in the scan list or not, can be designated as a look back channel. When a channel is designated as a look back channel, and the channel is selected, the radio will periodically look back to the priority channel during reception on the selected channel. The radio does not require a scan list to be entered in order to use this function, however, the radio **MUST** have a priority channel selected for the function to work.

- NOTE: The programmer must disallow the programming of a channel as a look back channel if no priority channel was selected.

The channel scan speed is system programmable in a range of 50 milliseconds to 2 seconds in 10 millisecond increments. The default value is 100 milliseconds.

Scan Delay Time

Scan delay time is system programmable. The scan delay is the time the unit remains on a scanned channel, after receiving or transmitting on that channel. The time is programmable from 1 to 10 in 1 second increments. The default value is 4 seconds.

The scan delay time will be reset each time the receive channel is active and each time the PTT is pushed on that channel. As long as the conversation continues on the channel, the receiver or the transmitter is active before the scan delay time expires, the unit will not resume scanning.

As a programmable option, the LED on the top panel of the unit will flash at the scan rate while in the scan mode. If the "LED scan indication" is programmed to enable the LED will flash. If it is programmed to disable, the LED will not flash.

Busy Channel Lockout

If this feature is enabled, the unit will not transmit when a carrier is present. A beep tone will sound when the PTT is depressed.

Marked Idle Enable

If this function is enabled, the unit will transmit provided that the correct programmed CTCSS tone or DCS code has been decoded. This function is essential for repeater operation.

Normal/Inverted DCS

This function is selected by channel during programming of the radio. During programming of each channel of the radio, a selective signaling option for TX and RX is selected. When the DCS signaling option is elected, it can be selected as either normal or inverted. The selection can be made differently for TX and RX.

Standard/Non-Standard CTCSS

When programming a channel with CTCSS, any frequency from 55 to 250 Hz can be selected in 0.1 Hz increments. The radio is capable of encoding and decoding two non-standard CTCSS tones.

Transmit Time-Out-Timer (TOT)/TX Inhibit

The time-out-timer is system programmable for 10 seconds to 990 seconds, in 10 second increments and can also be selected as disabled. The addition to this feature is a programmable lock-out-timer that inhibits the radio transmitter for a specified time after the time-out time expires.

When the time-out-timer function is enabled, and the TX inhibit function is disabled, the radio will transmit after the time-out-timer has expired and the PTT button is released and depressed again. With the TOT and TX inhibit, the radio will not transmit after the time-out has expired, even if the PTT is released and depressed again. Transmission will not be allowed until the TX inhibit time has expired. TX inhibit time is system programmable from 5 to 60 seconds in 5 second increments. The radio will beep one time, 5 seconds before the TOT time expires. This will indicate to the user that the transmitter is about to be locked out. If the PTT is released and depressed again anytime before the TOT has expired, the TOT time will be reset. If the beep tone enable/disable is set to disable, the one beep will not be issued. The radio will beep 4 times when the TOT time expires. After the TX inhibit time passes, the radio will beep one final time.

VCO Lock Time

The micro will allow more lock time for the VCO before the out-of-lock beep indication.

Low Battery Indication

Low Battery Indication will be changed so that it does not inhibit RX and will allow one transmission after low cell is indicated. Low cell will not be indicated during transmit mode. If the battery goes below specified limits during the TX mode, low cell will be indicated immediately after releasing the PTT button.

After the low cell indication is issued, the transmitter can only be used one time. When the PTT is pushed again and then released, the transmitter is locked out until the unit is powered down and then powered back up.

Memory Protect

The software is such that if the radio is inadvertently put into program mode it will not lose the contents of the EEPROM memory. Data will only move in and out of the memory when the programmer is attached.

External Option Detect

An input to the microprocessor will be available that will indicate to the microprocessor that the external option has been selected. This input should be connected to the external option connector. External option should be selected for each channel. If a channel is selected during programming for external option, this input should be active when the channel is selected during operation of the unit.

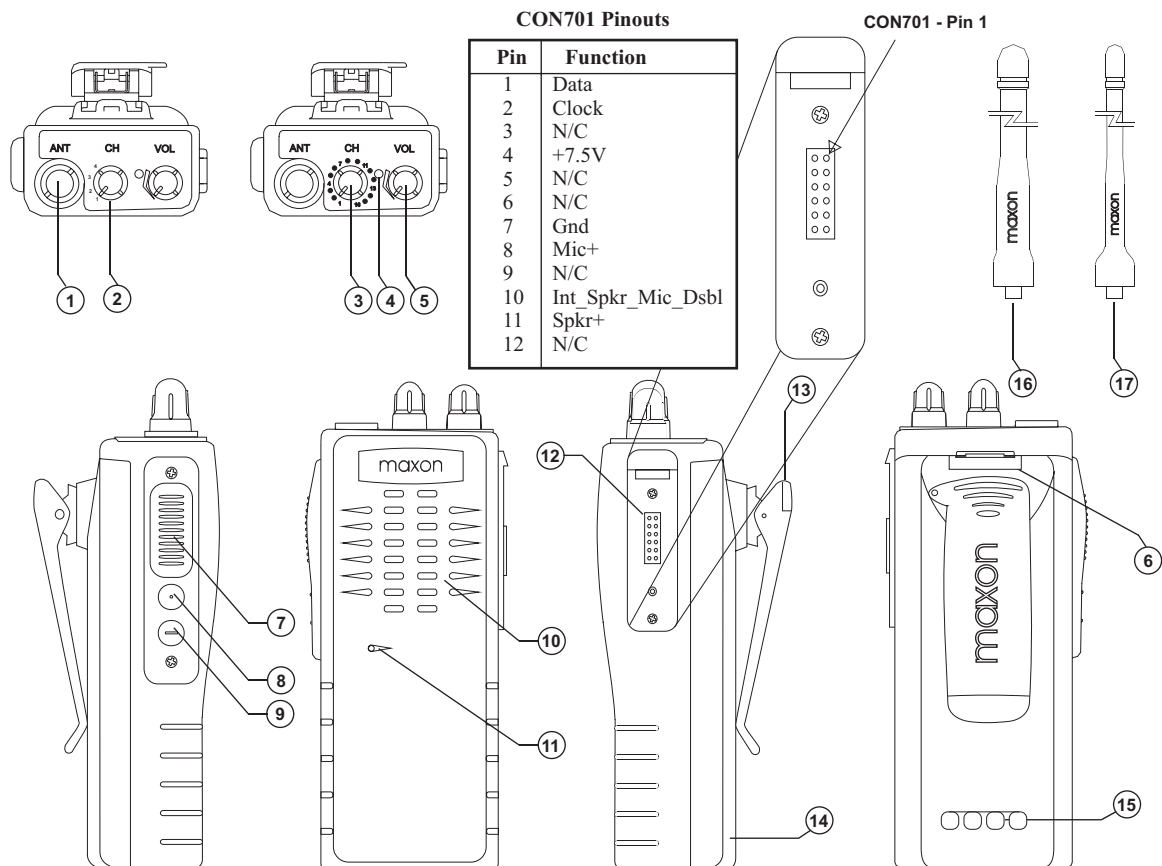
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DESCRIPTION OF CONTROLS

The controls, indicators and antenna connections on the VHF and UHF Scanning Handheld Series radios are all located on the top panel. The accessories socket is located on the radio chassis right hand side. The monitor and PTT buttons are located on the radio chassis left hand side.

| ITEM | DESCRIPTION |
|----------------------------------|---|
| 1. Antenna Connector | 1/4" UNEF socket |
| 2. 4 Channel Select Switch | Rotary switch, used to select one of four and to engage in scanning function |
| 3. 16 Channel Select Switch | Rotary switch, used to select one of sixteen and to engage in scanning function |
| 4. Status Indicator (busy TX/BT) | Tri-colored LED indicator |
| 5. ON/OFF Volume Control | Main power switch and volume control. Fully counter-clockwise is OFF position |
| 6. Battery Lock | Used to lock the battery in place |
| 7. Push-To-Talk Button | Push to talk, release to listen |
| 8. Monitor Button | When pressed, monitors the chosen channel |
| 9. Option | Used for controlling installed external option |
| 10. Speaker | Sound reception |
| 11. Microphone | Sound transmission |
| 12. External Speaker | Socket used for external microphone with speaker |
| 13. Belt Clip | Belt Clip |
| 14. Battery | Power Supply |
| 15. Battery Charger Contacts | Contacts used for charging battery |
| 16. VHF Antenna | Antenna |
| 17. UHF Antenna | Antenna |



THEORY OF OPERATION

The VHF and UHF scanning handheld series radios are comprised of one main PCB. The main PCB contains the transmitter, receiver and control circuits. The control circuits contain the micro controller and associated digital circuits.

DIGITAL CIRCUITS

IC 411 is a digitally-controlled analog switch which internally consists of three single pole, double throw switches. By placing a high (5V) or low (0V) on the control lines which consists of A, B and C. A controls the X ports, B controls the Y ports and C controls the Z ports. Example: A high on control A would connect X to X1. A low on control A would connect X to X0.

CTCSS/DCS Decode Circuits

Discriminator audio from Pin 9 IC5 is fed into and associated parts, which are the first 2 poles of a 6th order 250 Hz Chebyshev low pass filter. The output from pin 1 (IC406A) is fed into IC411 (Pin 2) and output to pin 15 (IC411). The signal is then fed to Pin 8 (IC407) which is a 6th order low pass Butterworth switched capacitor filter. The output from the Butterworth filter (Pin 3 IC407) is then fed to the remaining 4 poles of the 6th order Chebyshev, which consist of IC406C and one of the two operational amplifiers internal to IC407 (MF6-100) along with associated components. Both the Chebyshev and the Butterworth combines for a 4dB ripple low pass filter when programmed for 250 Hz. The output of IC406C (Pin 8) is fed into the remaining operational amplifier internal to IC407 (MF6-100) which forms the squaring circuit for the Decode signal. The signal is output from Pin 2 IC407 (MF6-100) and fed into IC409 (micro) where it is matched with a preprogrammed frequency. If successful, a Decode occurs, which is shown by a green L.E.D. on the top panel of the VHF and UHF Scanning Handheld and audio is heard. If valid Decode was not seen, the busy L.E.D. (Yellow) would be shown.

CTCSS/DCS Encoder Circuit

During TX encode the tone squelch digital signal is produced as a 3-bit parallel word at Pins 15, 16, and 18 of the micro controller (IC409). The 3-bit digital signal is converted to an analog signal by resistors R478, 479 and 480. The analog signal is fed into IC411 Pin 1. The signal is output on Pin 15 (IC411) and fed into Pin 8 of IC407 (6th order Butterworth clock tuned low pass filter). The filtered encode output from Pin 3 (IC407) is fed into Pin 13 (IC411) and output on Pin 14 (IC411). The filtered encode signal is fed to IC406B and RV403 (sub-audible gain control), the output of IC406B is then fed to the audio mixer circuit.

External Mic/PTT Control Circuit

The external microphone is connected via the CON701 connector on the right side of the handheld. The internal mic and speaker are disabled by grounding of pin 10 of CON701. Pulling pin 10 of CON701 low will bring the base of Q702 low, switching the transistor off. This removes the ground from the internal microphone, shutting it off. Pulling pin 10 of CON701 low will also pull the Gate of Q701 low, turning it off. This will disconnect the speaker from the rest of the circuit, shutting it off. To enable transmit the Q406 base impedance is low (below 20k ohm), Q406 and Q407 turn on and Q407 collector is low, which is connected to IC409 (micro) Pin-24.

Channel Select Circuit

One of 16 channels(SP-330 & 340) or one of 4 channels(SP-310 & SP-320) may be selected, using the channel switch on the top panel. The channel switch encodes the channel number selected into a 4-bit binary code. The binary code plus one is equal to the channel number. The binary code is decoded by the micro controller enabling the appropriate RX or TX frequency and associated data to be selected from the EEPROM.

- NOTE: Any of the channel locations may be a scanning position. Refer to Operators Manual for further instructions.

Low Battery Indicator Circuit

When the battery voltage drops below 5.4 VDC, D403 and Q417 turn on. The micro controller disables the transmitter and at the same time enables the red LED and sends an alert tone to warn the user. The battery should be replaced or recharged at this time (one tx allowed after low battery).

EEPROM

RX/TX channels, CTCSS/DCS as well as other data from the programmer are stored in the EEPROM. The data stored is retained without power supplied. This is a non-volatile memory. The EEPROM may have information re-programmed or erased. IC408 is an EEPROM with 2048 (8x256) capacity and data is written and read serially.

High Pass Filter

The high pass filter is an 8-pole, 1 dB Chebyshev active filter that comprises IC410 and associated components. The de-emphasis is provided by resistor R451 and capacitor C471. Receive audio is passed to IC410 by Pin 4 of IC411 where sub-audible tones below 300Hz are removed. Mic audio is also fed into IC410 via IC 411 (Pin 4) where sub-audible voice products below 300Hz are also removed.

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Mute (squelch) Circuit

The mute circuit which is controlled by the output of IC409 (micro) Pin 77 (386EN) is connected to Q34 via R122 which mutes the LM386IC on the RF circuits. Pin 77 also controls IC402B which mutes the audio path to the RF circuits.

TX Audio And Filter Circuits

The TX audio from the internal mic or external mic is fed into IC411 (Pin 3). The TX audio is output on Pin 4 (IC411) and into the high pass filter (IC410), where sub-audible voice products are removed. The TX audio output from IC410 is fed into IC404D & C, with associated parts form a mic amplifier and limiter. The output from Pin 8 IC404C is fed to RV402 (TX Modulation Level Adjust) and fed into IC404A & B to form a 3k low pass filter. The output of IC404A (Pin 1) is then fed into the Audio Mixer Circuit.

Analog Ground Supply

IC406D supplies (2.0V) to operational amplifiers circuits.

Audio Mixer And Inverter

IC405A is an audio mixer where audio and sub-audible tones are combined. RV401 is used as a balance control. IC405B is an inverter.

Monitor

The unit will contain a switch mounted on the PTT assembly for monitor function. This will be enabled or disabled by programming software.

RF CIRCUITS

Transmitter

The transmitter is comprised of:

1. Buffer
2. P.A. Module
3. Low Pass Filter
4. Antenna Switch
5. A.P.C. Circuits

Buffer

VCO output level is -6 dBm and amplified to +10dBm (UHF), +6dBm (VHF). The buffer consists of Q16 and Q17 for isolation and gain.

P.A. Module

The P.A. Module consists of Q501, Q502 and Q503. Three stage amplifier Q501 amplifies the TX signal from +10 dBm to 100 mW. Q502 is amplified to 1.0W. Q503 amplifies to 5W and then matched to 50 OHM using the L.C. network, thereby reducing the harmonics by -30 dB.

Low Pass Filter

L7, L8, L11, C72, C73, C74 and C75 are the 7th order Chebyshev low pass filter. Unwanted harmonic are reduced by -70 dBc.

Antenna Switch

When transmitting, the diodes D5 and D6 are forward biased enabling the RF signal passage to the antenna. D6 is shorted to ground inhibiting the RF signal to the front end. In receive the diodes D5 and D6 are reversed biased passing the signal from the antenna through L13 and C83 to the front end without signal loss.

Automatic Power Control (APC) Circuits

The APC circuit containing the variable resistors RV1, RV3, IC3 and Transistors Q18,Q19,Q21 and Q22. The current from the collector of Q503 is detected at R109, it is converted to voltage at IC3A and compared with the reference voltage at IC3B. In transmit (+5V) is applied to the input of IC3B via the potential divider R45 and R46. The differential signal at the output of IC3B is passed to Q21 and Q22, This voltage controls collector voltage of Q502 that produces a constant power output. RV1 is used to adjust the high power and RV3 is used to adjust the low power.

RF CIRCUITS PLL SYNTHESIZER

12.8 MHz TCXO

The TCXO contains the 3-stage thermistor network compensation and crystal oscillator and modulation ports. Compensation is +/-5 PPM or less from -30c to +60c.

PLL IC Dual Modules Prescaler

Input frequency of 12.8 MHz to IC2 MC14519 pin 20 is divided to 6.25 kHz or 5 kHz by the reference counter, and then supplied to comparator. RF signal input from VCO is divided to 1/64 at prescaler in IC2, Divided by A and N counter in IC2 to determine frequency steps, and then supplied to the comparator. PLL comparison frequency is 6.25/5 kHz so that minimum programmable frequency step is 5/6.25 kHz. A and N counter is programmed to obtain the desired frequency by serial data in CPU. In comparator, the phase difference between reference and VCO signals is compared. When the phase of reference frequency is leading, Fr is output, but when VCO frequency is leading, Fv is the output. When Fv=Fr, phase detector out is very small 0v pulse. 64/65 modulus prescaler is comprised in IC2, and has two output ports:

Port A pin 16: tx enable 2

Port B pin 15: prescaler power save control in PLL IC pin 13 labeled test2 allows the technician to see the output of the dual modules pre-scaler for trouble shooting purposes, no connection should be made to this pin.

Level Shifter & Charge Pump

The charge pump is used for changing output signals Fr, Fv at PLL IC from 0-5v to 0-12v necessary for controlling vco.

Reference Frequency LPF

The Loop Filter contains R12, C21 and C22. LPF settling time is 12 mS with 1 kHz frequency. This also reduces the residual side-band noise for the best signal-to-noise ratio.

DC to DC Converter

The DC to DC converter converts the 5v to 14-16v to supply the necessary voltage for wide range of frequencies in the VCO.

VCO

The VCO consist of an RX VCO and TX VCO. Is switched TX/RX by power source. It is configured as a colpits oscillator and connected to buffer as cascade bias in order to save power.

The varicap diode D201/D301 are low-resistance elements and produce a change in frequency with a change in reverse bias voltage (2-11v). L203/L303 are resonant coil, which changes the control voltage by the tuning core. D202 modulation diode, modulates the audio signal. C204 compensate

for the non-linearity of the vco due to modulation diode, and maintain a constant modulation regardless of frequency.

RECEIVER

Front End

The receive signal is routed backward through the low pass filter, then onward to Pin 1 of the Hybrid Receiver Front End Module to a bandpass filter consisting of (VHF C622 through C608, L607 through L604) and (UHF C601 through C610, L601 through L603) is coupled to the base of Q601 which serves as an RF amplifier. Diode D601 serves as protection from static RF overload from nearby transmitters. The output of Q601 is then coupled to a second bandpass filter consisting of (VHF C607 through C601, L603 through L601) and (UHF C612 through C623 and L604 through L607). The output of Pin 6 is then coupled to the doubly balanced mixer D9. The receiver front end module is factory pre-tuned and requires no adjustment. Repair is effected by replacement of the entire module of the proper banded module. These are VHF 148 MHz to 174 MHz and UHF 440 MHz to 470 MHz. The receiver front end module signal pins are as follows:

1. RF Input
2. Input Ground
3. N/A
4. Receive +5V
5. Ground
6. Output

First Mixer

D9, T2 and T3 are double balanced mixers which provide the 45.1 MHz intermediate frequency output. The filtered frequency from the front end module is coupled to T2. The 45.1 MHz IF output is matched to the input of the 2-pole monolithic filter by L14, L31, C69 and C97. The crystal filter provides a bandwidth of +/-7.2 kHz from the operating frequency providing a high degree of spurious and intermodulation protection. Additionally, a 90 MHz trap (XF1) is also placed at the filter output to provide additional attenuation of the second order IMD. The output of the filter is impedance matched by C97 and C69 to the base of the post of filter IF amplifier Q25.

Second Oscillator Mixer Limiter And FM Detector

The output of the post filter amplifier, Q25, is coupled, via C98 to the input of IC5 (MC3371). IC5 is a monolithic single conversion FM transceiver, containing a mixer, the second local oscillator, limiter and quadrature detector. Crystal X1 44.645 MHz is used to provide resultant 455 kHz signal from the output of the second mixer. The mixer output is then routed to CF1 (455F) or CF2 (455HT). These ceramic

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filters provide the adjacent channel selectivity of 25 kHz or 12.5 kHz bandwidth.

Squelch (mute) Circuit

The squelch circuit switches off the power amplifier when no audio signal is present. The squelch circuit consists of a 16 kHz band pass filter and a noise detector circuit.

16 kHz Band Pass Filter

The audio signal from Pin 9 of IC5 (MC3371) is filtered by a 16 kHz band pass filter consisting of L16 and L17. The noise in the IF passband is accepted and voice frequencies and their products are rejected. Any noise present at the output of the filter is applied to the noise detector circuit via RV2. RV2 is used to adjust the squelch circuit sensitivity and is normally adjusted to produce a noise squelch opening sensitivity of 10 dB to 12 dB SINAD.

Noise Detector

The noise detector in conjunction with IC5 consists of Q26, Q27, D8, D11, TH1, and their associated biasing components. Noise fed from the output of RV2 is amplified by Q27, then rectified by D11. This output is then buffered by Q26 and fed to Diode D8, which controls Q24 providing ground to the mute control Pin 14 of IC5.

Low Pass Filter

A low pass filter formed by C115, C116 and R91 removes any extraneous 455 kHz energy from the AF output of the FM receiver chip.

Speaker Audio Amplifier

After signal detection and audio filtering, the low level audio is returned to the RF circuit via VR3. This is then routed to Pin 3 of IC6, (LM386N-3), to provide speaker audio. IC6 is enabled by a logic high applied to Q34 which in turn enables Q33, applying power to Pin 7 of IC6.

MAINTENANCE AND REPAIR

GENERAL

Any repair or adjustment should only be made by or under the supervision of a qualified radio service technician.

When removing or fitting, use the Exploded View and Parts List (Page 51) in conjunction with the following procedures:

REMOVING & REPLACING THE BELT CLIP

Removing the belt clip:

1. Depress the metal release tab located on the top of the belt clip with one hand.
2. With the other hand push the belt clip out of the belt clip rail.

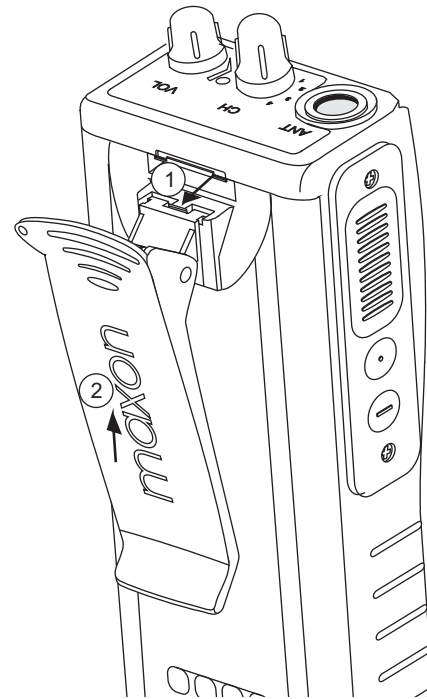


Figure 1-Belt Clip Removal

To replace the belt clip:

1. With the slides of the belt clip positioned in line with the belt clip guide rails, slide the belt clip into position until a click is heard.

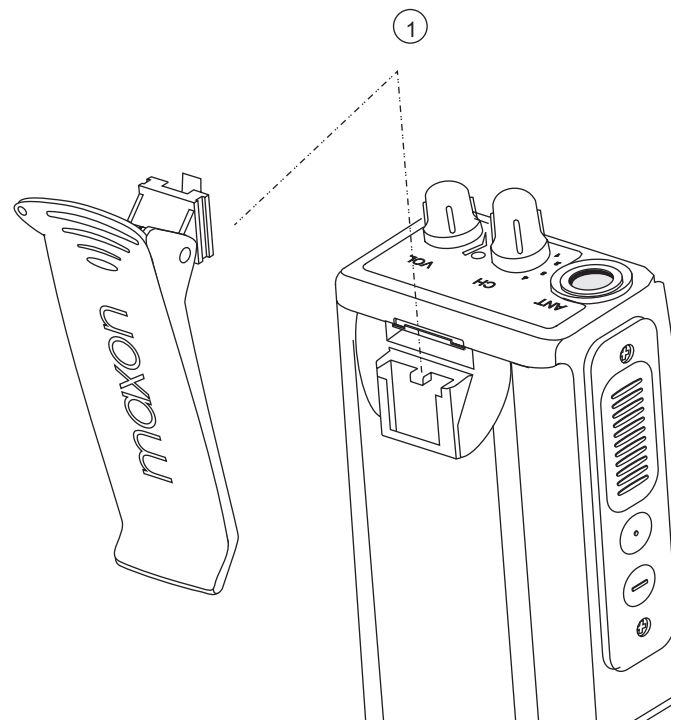


Figure 2-Belt Clip Installation

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REMOVING & REPLACING THE BATTERY

To remove the battery:

1. Holding the radio chassis in one hand, press and hold the battery release catch on the upper back of the radio with the other hand.
2. Pull the battery back and away from the radio.
3. Remove the battery from the radio.

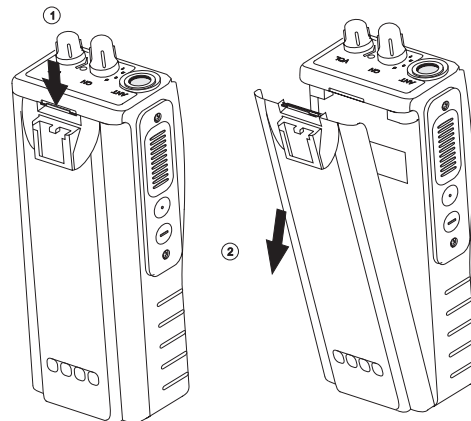


Figure 3-Battery Removal

To replace the battery:

1. Position the battery on the battery guide rail at the bottom of the radio.
2. Move the top of the battery toward the radio until a click is heard.

REMOVING & REPLACING PTT ASSY.

To remove the PTT assembly:

1. Remove the 2 screws located at the top and bottom of the PTT switch holder housing. This will allow removal of the PTT holder (A) and PTT pad (B).

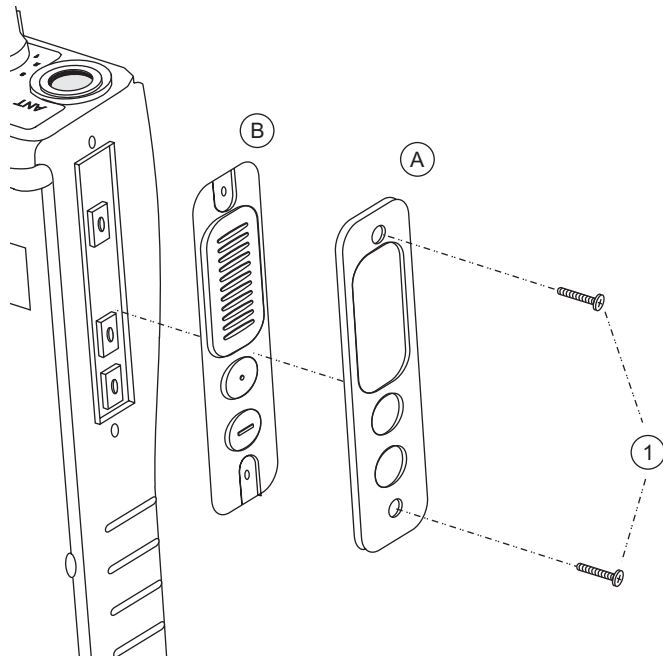


Figure 4-PTT Removal

2. By placing thumb under bottom of the PTT assembly and gently pulling outward, unplug PTT Assembly from Main Board.

To replace the PTT assembly:

1. Reverse the steps taken to remove the PTT assembly.
2. Insure that the PTT jack is aligned properly when inserting into Main Board.

REMOVING & REPLACING THE ACCESSORY CONNECTOR

To remove the Accessory Connector:

1. Remove the Accessory Connector Cover (Item 2) by removing the screw (Item 1).
2. Remove the Accessory Connector (Item 5) by removing the two screws (Items 3 & 4) and pulling outwards on the Connector (Item 5)

To replace the Accessory Connector:

1. Reverse the steps taken to remove the Accessory Connector.

REMOVING & REPLACING THE ANTENNA & CONTROL KNOBS

To remove the Antenna:

1. Turn the Antenna counterclockwise and remove.

To replace the Antenna:

1. Reverse the steps taken to remove the Antenna.

To remove the Control Knobs:

1. Grip the control knobs firmly between thumb and index finger and pull in a straight upward direction.

To replace the Control Knobs:

1. Reverse the steps taken to remove the Control Knobs.

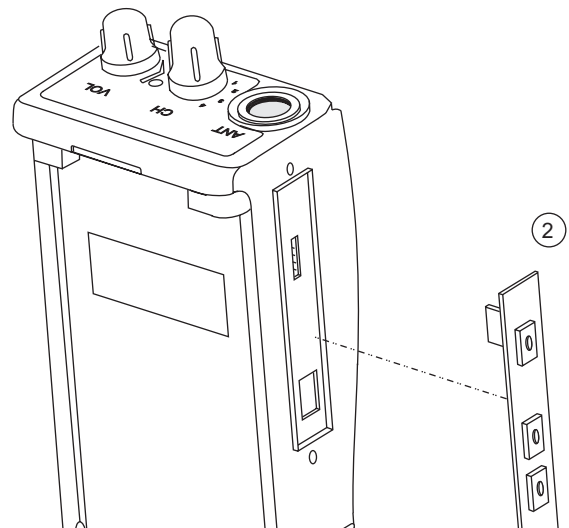


Figure 5-PTT Installation

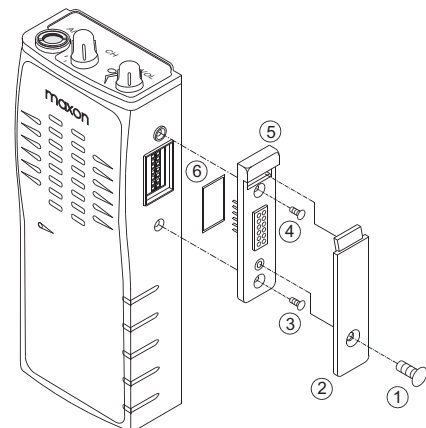


Figure 6-A/C Removal & Installation

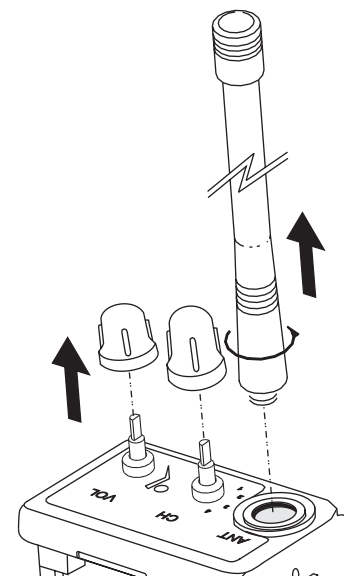


Figure 7-Control Knob Removal & Installation

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REMOVING & REPLACING THE BACK COVER

To remove the Back Cover:

1. Remove battery. (Refer to Removing & Replacing the Battery)
2. Unscrew the four Back Cover mounting screws located on the Back Cover of the radio.

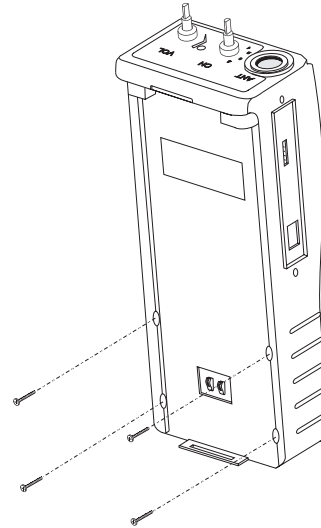


Figure 8-Back Cover Removal & Installation

3. Remove the Back Cover by pulling the lower battery bracket away from the radio.
4. The Back Cover can now be removed by pulling the Back Cover away from the radio chassis. The self forming gasket ring (A) should remain on the Back Cover.

To replace the Back Cover:

1. Reverse the steps taken to remove the Back Cover.



Figure 8B-Back Cover Removal & Installation

REMOVING & REPLACING THE MAIN BOARD

To remove the Main Board:

1. Remove the Battery (Refer to Removing & Replacing the Battery).
 2. Remove the PTT Assembly (Refer to Removing & Replacing the PTT Assembly).
 3. Remove the Dust Cap (Refer to Removing & Replacing the Dust Cap).
 4. Remove the Antenna & Control Knobs (Refer to Removing & Replacing the Antenna & Control Knobs).
 5. Remove the Back Cover (Refer to Removing & Replacing the Back Cover).
 6. Insert a small straight (Flat Head) screwdriver blade between the Main Board and the radio chassis.
 7. Gently pull backward with the screwdriver until the Main Board has been unsnapped from the lower section of the chassis.
 8. It may be necessary to pull the Main Board up a little more to gain easier handling for removal.
- **CAUTION:** If performing step 8, insure that the screwdriver is placed on the metal frame of the Main Board and not directly on the Main Board PCB. Damage to the Main Board and Microprocessor could occur.
9. Grip the Main Board near the indicated arrows as shown in Figure 9B.
 10. Gently work the Main Board in an up & down motion and pull in the direction indicated by the arrow in Figure 9B.
- **CAUTION:** Do not use excess force when removing the Main Board from the chassis. Damage to the speaker connection could occur.
- **Note:** It is not necessary to remove the stud mount antenna jack from the radio.
11. Remove the Speaker wire connector from the Main Board connector.

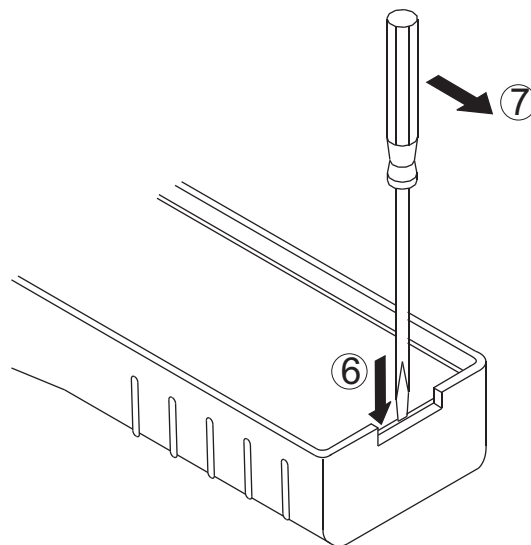


Figure 9-Main Board Removal & Installation

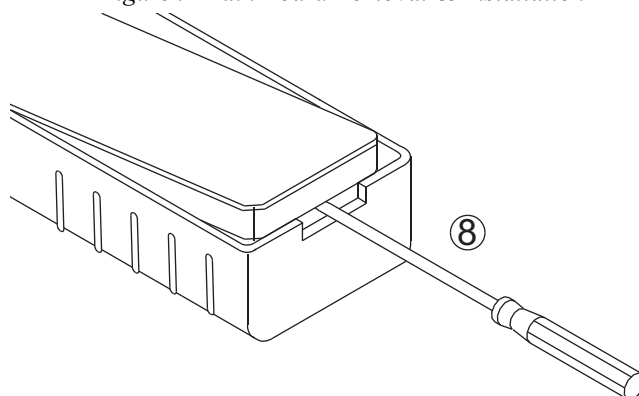


Figure 9A-Main Board Removal & Installation

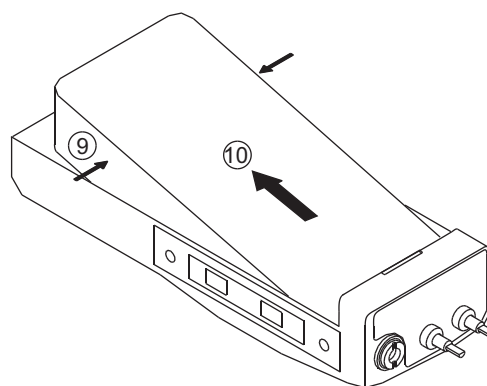


Figure 9B-Main Board Removal & Installation

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To replace the Main Board

1. Reverse the steps taken to remove the Main Board.
2. When installing the Main Board into the chassis insure that the LED light guide is aligned properly.
3. When installing the Main Board into the chassis, place 2 fingers over the black rubber control knob dust covers to insure that the dust covers do not get pushed out of the appropriate seating position.

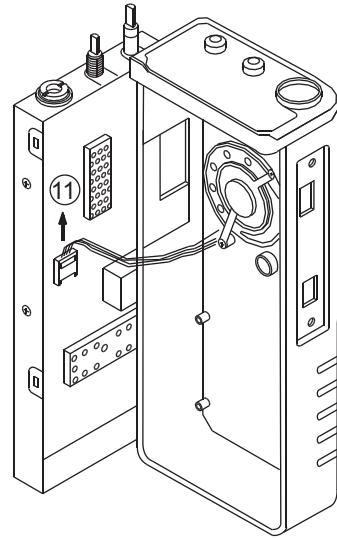


Figure 9C-Main Board Removal & Installation

REMOVING & REPLACING THE DAUGHTER BOARDS

The Daughter Boards are soldered into the Main Board Assy.

1. Remove the Main Board (Refer to Removing & Replacing the Main Board).
2. Unsolder the appropriate Daughter Board from the Main Board Assembly.

To Replace a Daughter Board:

1. Ensure that the Main Board Assembly and Daughter Board are mechanically clean.
 2. Insert the daughter board in the required position.
 3. Ensure the Daughter Board is properly seated in the Main Board Assembly.
 4. Solder the Daughter Board into position.
- CAUTION: To avoid damage to the Main Board Assembly, soldering must be accomplished quickly. Refer to Component Replacement section of manual located on this page.

REMOVING & REPLACING THE SPEAKER

To remove the speaker:

1. Remove the Main Board (Refer to Removing & Replacing the Main Board).
2. Unscrew the two speaker mounting bracket screws from the chassis.
3. Desolder the two pin wire harness from the speaker.
4. Remove the speaker.

To replace the speaker

1. Reverse the steps taken to remove the speaker.

COMPONENT REPLACEMENT

Surface Mount Components

Surface mount components should always be replaced using a temperature controlled soldering system. The soldering tools may be either a temperature controlled soldering iron or a temperature controlled hot-air soldering station. A hot-air system is recommended for the removal of components on these boards. With either soldering system, a temperature of 700° F (371° C) should be maintained.

The following procedures outline the removal and replacement of surface mount components. If a hot-air soldering system is employed, see the manufacturer's operating instructions for detailed information on the use of your system.

- CAUTION: Avoid applying heat to the body of any surface mount component using standard soldering methods. Heat should be applied only to the metalized terminals of the components. Hot-air systems do not damage the components since the heat is quickly and evenly distributed to the external surface of the component.
- CAUTION: The CMOS Integrated Circuit devices used in this equipment can be destroyed by static discharges. Before handling one of these devices, service technicians should discharge themselves by touching the case of a bench test instrument that has a 3-prong power cord connected to an outlet with a known good earth ground. When soldering or desoldering a CMOS device, the soldering equipment should have a known good earth ground.

Surface Mount Removal

1. Grip the component with tweezers or small needle nose pliers.
2. Alternately heat the metalized terminal ends of the surface mount component with the soldering iron. If a hot-air system is used, direct the heat to the terminals of the component. Use extreme care with the soldering equipment to prevent damage to the printed circuit board (PCB) and the surrounding components.
3. When the solder on all terminals is liquefied, gently remove the component. Excessive force may cause the PCB pads to separate from the board if all solder is not completely liquefied.

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4. It may be necessary to remove excess solder using a vacuum de-soldering tool or Solder wick . Again, use great care when de-soldering or soldering on the printed circuit boards. It may also be necessary to remove the epoxy adhesive that was under the surface mount component and any flux on the printed circuit board.

the Surface Mount Component Replacement procedures. it may not be necessary to “tin” all (or any) of the IC pins before the installation process.

Surface Mount Component Replacement

1. “Tin” one terminal end of the new component and the corresponding pad of the PCB. Use as little solder as possible.
2. Place the component on the PCB pads, observing proper polarity for capacitors, diodes, transistors, etc.
3. Simultaneously touch the “tinned” terminal end and the “tinned” pad with the soldering iron. Slightly press the component down on the board as the solder liquefies. Solder all terminals, allowing the component time to cool between each application of heat. Do not apply heat for an excessive length of time and do not use excessive solder.

With a hot-air system, apply hot air until all “tinned” areas are melted and the component is seated in place. It may be necessary to slightly press the component down on the board. Touch-up the soldered connections with a standard soldering iron if needed. Do not use excessive solder.

- CAUTION: Some chemicals may damage the internal and external plastic parts of the radio.

4. Allow the component and the board to cool and then remove all flux from the area using alcohol or another approved flux remover.

Surface Mounted Integrated Circuit Replacement

Soldering and de-soldering techniques of the surface mounted IC's are similar to the above outlined procedures for the surface mounted chip components. Use extreme care and observe static precautions when removing or replacing the defective (or suspect) IC's. This will prevent any damage to the printed circuit board or the surrounding circuitry.

The hot-air soldering system is the best method of replacing surface mount IC's. The IC's can easily be removed and installed using the hot-air system. See the manufacturer's instructions for complete details on tip selection and other operating instructions unique to your system. If a hot-air system is not available, the service technician may wish to clip the pins near the body of the defective IC and remove it. The pins can then be removed from the PCB with a standard soldering iron and tweezers, and the new IC installed following

PROGRAMMING

The SP-300 Series portable radios require the ACC-2300 programming cable. With the 25 pin "D" type connector installed on the computer, take the other end of the programming cable and insert it in the receptacle located on the opposite side of the PTT on the radio. For further information, please refer to the ACC-904 Programming Manual.

Cloning

Following the steps below, the frequencies and functions can be programmed from radio to radio by using a cloning cable.

1. Ensure that both radios' power switches are in the "OFF" Position.
2. Place master radio (the radio which already has desired program information in the EEPROM) in the data "WRITE" mode by holding the radio's monitor switch and then turning radio power switch to the "ON" position (the green LED on the radio flashes). Release monitor switch on the fourth led flash. (The radio LED will change to alternating red and orange flashes.)
3. Place the slave radio (the radio which is not programmed, or has program information that will be revised) into data "READ" mode by holding monitor switch and then turning the radio power switch to the "ON" position (the green LED on the radio flashes). Release the monitor switch on the third led flash (the LED will change to alternating green and orange flashes).
4. Connect the cloning cable through mic jack.
5. Press the slave radio's monitor switch. The alternating green and orange flashing will stop.
6. Press the master radio's monitor switch. The alternating red and orange flashing will stop. Release the monitor switch, the green led of both radios will flash.
7. After cloning, the slave radio resets and works normally with re-programmed frequency, and the master radio flashes orange led. Press monitor switch, and then the radio will repeat step 2).
8. For cloning other radios, repeat steps 3 through 7.

ALIGNMENT PROCEDURE

The SP-300 U/V Receiver is by design, broad band, covering UHF(440 to 470 MHz) and VHF(148-174MHz) and should require no special alignment, unless repairs are performed on the receiver portion. The only alignment normally required is to the squelch circuit.

SQUELCH ADJUSTMENT

1. Select a receiver channel that is programmed for narrow band (12.5kHz) operation.
2. Set the RF signal generator to the receiver frequency. Set the AF modulation signal to 1 kHz at 1.5K deviation.
3. Adjust the RF output level of the RF signal generator until the 1kHz signal is heard.
4. Adjust the RF signal to the level desired for squelch sensitivity as you monitor SINAD. This is usually 8dB to 12 dB sinad.
5. On the Main board, adjust RV2 until the squelch is just unmuted (open).
6. Switch off the RF generator (squelch should close).
7. Switch on the RF generator, Squelch should open at the SINAD point where RV2 was adjusted.
8. Select a receiver channel that is programmed for wide band operation (25kHz).
9. Set the RF signal generator to the receiver frequency. Set the AF modulation signal to 1 kHz at 3K deviation.
10. Adjust the RF output level of the RF signal generator until the 1kHz signal is heard.
11. Adjust the RF signal to the level desired for squelch sensitivity as you monitor SINAD. This is usually 8dB to 12 dB SINAD.
12. On the Main board, adjust RV4 until the squelch is just unmuted (open).
13. Switch off the RF generator (squelch should close).
14. Switch on the RF generator, Squelch should open at the SINAD point where RV4 was adjusted.

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15. Disconnect the test equipment.

Should repairs be required, the following procedures should be applied:

RX VCO

1. Set the unit to the highest receive frequency, 470 MHz(UHF), 174MHz(VHF) and adjust the VCO L303 to 10 volts.
2. Set the unit to the lowest receive frequency 440 MHz(UHF), 148(VHF) and check that the VCO voltage is above 2.0 volts. Adjust L303 for 2.0 volts.

● *Note: Use TP1 to measure the voltage.*

RECEIVER

1. Apply a standard test signal to the receiver antenna terminals.
2. Adjust T1 for maximum sensitivity and audio output with minimum audio distortion.

TRANSMITTER

Connect the unit to a Service Monitor with the power meter setting to the 10 W scale (or autorange).

TCXO

Set the channel selector to the mid-range frequency 460 MHz, adjust TC701(VHF) on the TCXO board, RV5 (UHF) on the Main board, for a reading of 460 MHz +/-200 Hz (155 MHz VHF models).

TX VCO

1. Set the unit to the highest transmit frequency, 470 MHz(UHF), 174MHz(VHF) and adjust the VCO L203 to 10 volts.
2. Set the unit to the lowest transmit frequency 440 MHz(UHF), 148(VHF) and check that the VCO voltage is above 2.0 volts. If voltage is below 2.0 volts, adjust L203 for 2.0 volts or more.

CTCSS, DCS & DEVIATION ALIGNMENT

- 1a. Set the unit to a mid-frequency range and a CTCSS of 67Hz. Push PTT and adjust RV403 for desired CTCSS tone deviation.

1b. Switch to a channel with the same frequency and CTCSS of 250.3Hz. Push PTT and adjust RV401 to desired CTCSS tone deviation, same as above step.

1c. Switch between the 67Hz channel and the 250.3Hz channel and adjust RV401 until the deviation is the same on both channels. It may be necessary to readjust RV403 to get the desired deviation.

2. Inject a 6mV signal of 1000Hz to the microphone input. This should produce a 3kHz deviation for 25kHz(S) channel spacing and 1.5kHz for 12.5kHz(N) channel spacing, measure transmit distortion, that should be less than 5%. Increase the audio input level to 20mV.

3. Set the deviation by adjusting RV402 to 4.5kHz for 25kHz channel spacing(S) and to 3kHz for 12.5kHz channel spacing(N) on a non-CTCSS or DCS channel for the initial setting. Select a CTCSS or DCS frequency and verify that the deviation is less than or equal to 5kHz(S) and 3kHz(N).

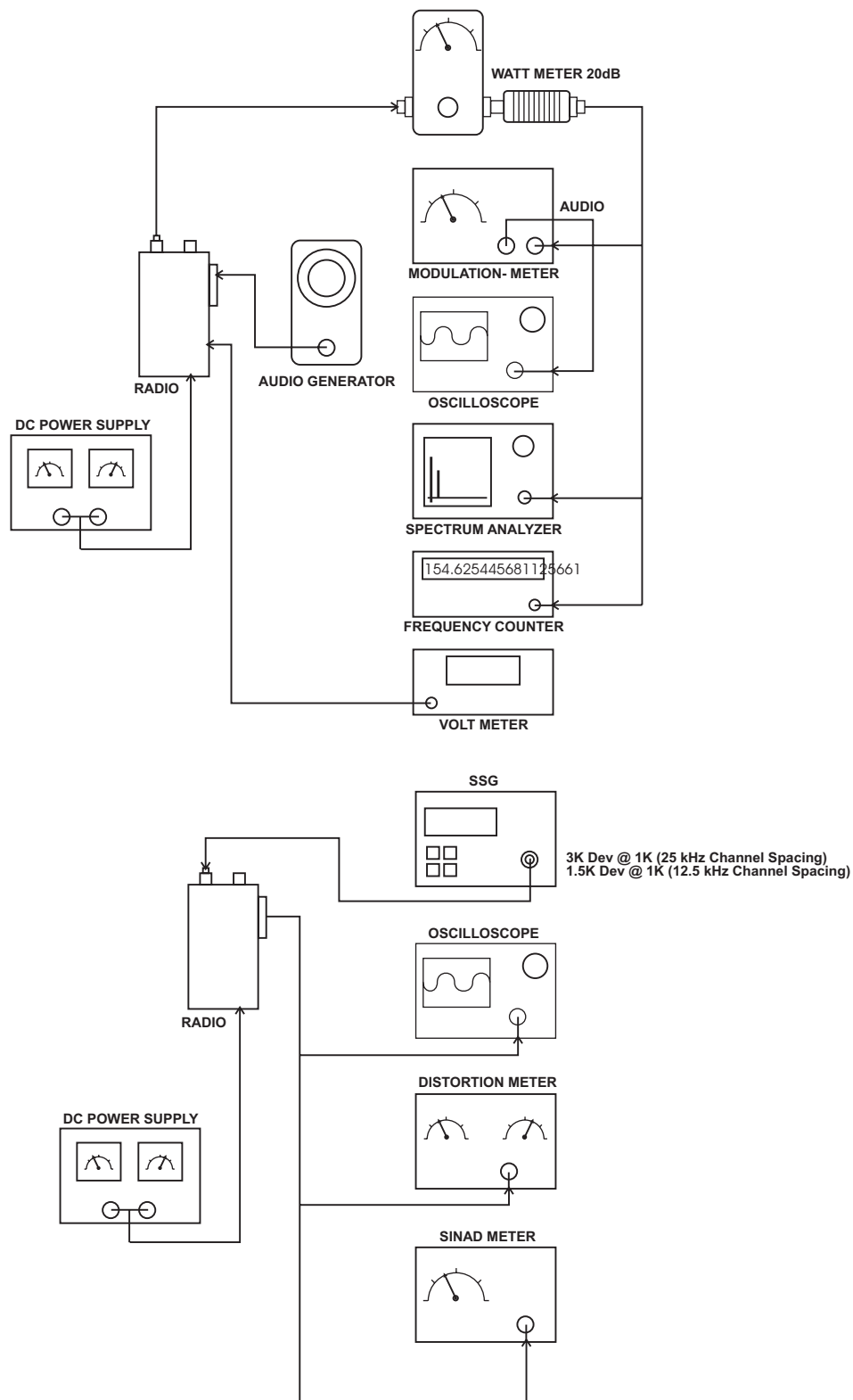
4. Vary the audio frequency from 300 to 3000Hz and verify that the deviation does not exceed 5kHz(S) and 3kHz(N).

APC

1. Select a channel which is programmed with high power. While transmitting, adjust RV1 in the APC circuit for 5 watts +/- 0.1 watt.

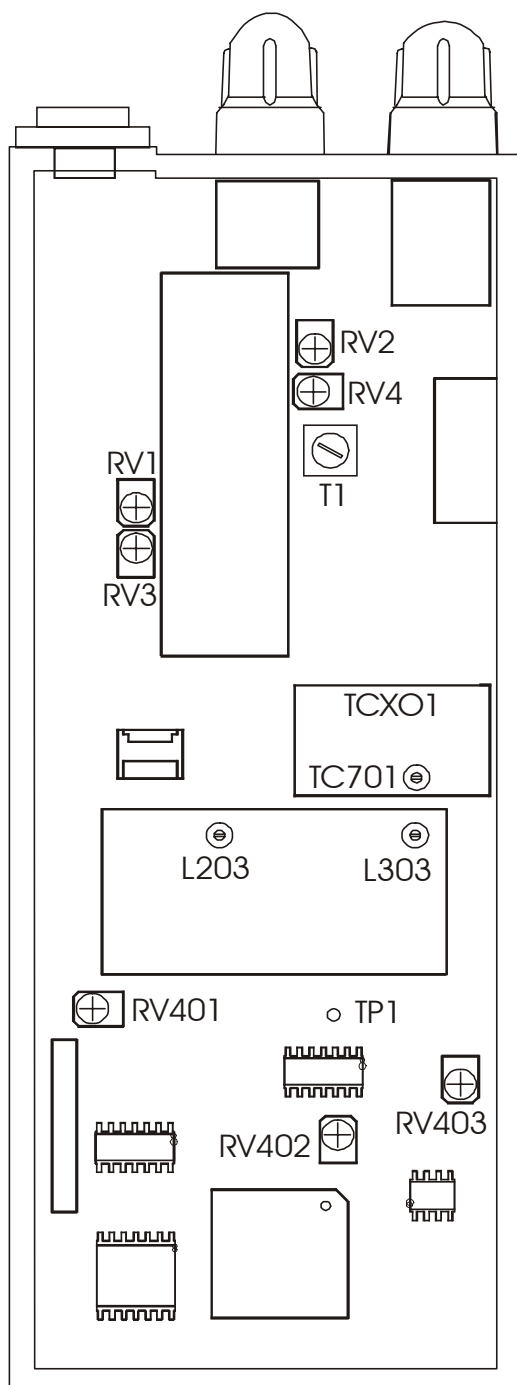
2. Select a channel which is programmed with low power. While transmitting, adjust RV3 in the APC circuit for 1watt +/-0.1 watt.

TEST EQUIPMENT SETUP

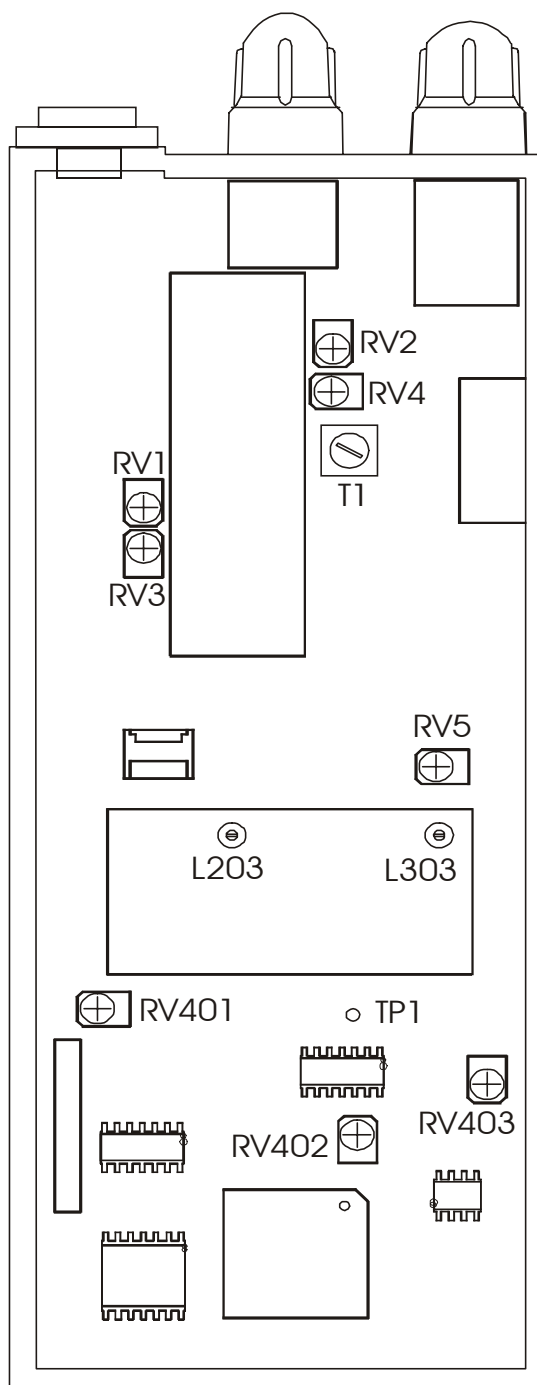


1. S.S.G. : @ 1kHz Audio:

ALIGNMENT POINTS DIAGRAM



**ALIGNMENT POINTS VHF & UHF
 WITH TCXO MODULE**



**ALIGNMENT POINTS UHF WITH
 OUT TCXO MODULE**

TROUBLESHOOTING GUIDE

| SYMPTOMS | CAUSES | COUNTER MEASURES |
|--|--|--|
| Unit does not Work | 1. Complete discharge of battery (7.5v+/-10%) 2. Fuse blown up (4a) 3. 5v voltage source | 1. Replace battery 2. Replace fuse 3. IC1 (5v+/-0.2v) |
| Warning Tone & No Work | 1. Low battery (lower than 5.6v) 2. PLL error 3. Filtering error 4. EEPROM fail | 1. Replace or charge battery 2. Check TCXO/ VCO/ PLL IC 3. Check LPF (IC407) 4. Re-programming |
| Defective RX Audio | 1. No audio at speaker 2. Busy lamp (yellow Color) is o.k. but no Audio | 1. Replace speaker or check wire 2. Check tone ch, audio amp(IC6) 300hz HPF (IC410) Sw IC (IC402B, IC411) |
| Bad RX Sensitivity (-10 to -60db) | 1. Defective ANT sw 2. Defective front-end 3. Defective dbm 4. IF IC 5. VCO level drop 6. Change of 1st local Frequency | 1. Check D5,D6 2. Check Q601 3. Check D9,T2,T3 4. Replace IC5 5. Rx VCO level>2dbm 6. Retune TCXO |
| Defective RX | 1. VCO frequency change or level drop 2. Defective voltage source | 1. Repair RX VCO 2. Defective IF IC(IC5) 3. IC1,Q1,Q3 |
| PLL Error | 1. Defective 12.8 MHz TCXO 2. Voltage source for Rx VCO/TX VCO 3. Defective PLL IC | 1. Replace TCXO 2. Check RX VCO/TX VCO 3. Replace IC2 |
| Low TX power Output | 1. APC | 1. Re-adjust RV1 |
| No TX power | 1. TX buffer 2. Power module 3. APC control | 1. Check Q16,17 2. Check Q501,502,503 3. Check Q22,D4 |
| No modulation | 1. Condenser mic 2. Sw IC & mic amp IC | 1. Check mic 2. Check IC411, 410, 405, 401,404 |
| No s.a.t.(tone) | 1. 250 hz LPF 2. RV403 adjustment | 1. Check IC406,407,411 2. Re-adjust RV403 |
| No programming | 1. Short protector VCC | 1. Check 6v on Q412, 413 2. Defective programming lead |

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VOLTAGE CHARTS

CONTROL CIRCUIT

| RX | | | | TX | | |
|-------|-----|-----|-----|-----|-----|-----|
| REF # | B | C | E | B | C | E |
| Q401 | 4.4 | 0.0 | 5.0 | 0.3 | 5.0 | 5.0 |
| Q403 | 0.0 | 4.6 | GND | 0.0 | 4.6 | GND |
| Q404 | 5.0 | 2.2 | 2.0 | 0.0 | 7.0 | 0.0 |
| Q405 | 5.0 | 1.8 | 1.7 | 5.0 | 1.8 | 1.7 |
| Q406 | 4.0 | 0.0 | 5.0 | 2.0 | 5.0 | 5.0 |
| Q407 | 0.0 | 4.5 | GND | 5.0 | 0.0 | GND |
| Q408 | 0.0 | 5.0 | GND | 2.0 | 0.0 | GND |
| Q410 | 4.3 | 0.0 | 5.0 | 4.3 | 0.0 | 5.0 |
| Q411 | 0.0 | - | GND | 0.0 | 0.0 | GND |
| Q412 | 0.0 | 7.5 | 7.5 | 0.0 | 7.5 | 7.5 |
| Q413 | 7.5 | 0.0 | GND | 7.5 | 0.0 | GND |

- NOTE: Q402 and Q409 are not fitted on this model series.

MAIN CIRCUIT

| RX | | | | TX | | |
|-------|------|-------|------|------|------|------|
| REF # | B | C | E | B | C | E |
| Q1 | 0.6 | 5.0 | 5.0 | 0.6 | 5.0 | 5.0 |
| Q2 | 5.0 | 0.0 | 5.0 | 0.3 | 4.7 | 5.0 |
| Q3 | 0.0 | 4.7 | 5.0 | 5.0 | 0.0 | 5.0 |
| Q4 | 0.0 | 5.0 | 5.0 | 0.0 | 5.0 | 5.0 |
| Q5 | 4.7 | 0.0 | 5.0 | 4.7 | 0.0 | 5.0 |
| Q6 | 4.0 | 18.0 | 5.0 | 4.0 | 18.0 | 5.0 |
| Q7 | 18.0 | ~3.0 | 18.0 | 18.0 | ~4.0 | 18.0 |
| Q8 | 5.0 | 0.0 | 5.0 | 5.0 | 0.0 | 5.0 |
| Q11 | 0.0 | 3.0 | 0.0 | 0.0 | 4.0 | 0.0 |
| Q12 | 1.6 | 4.5 | 1.0 | 0.0 | 0.0 | 0.0 |
| Q13 | 4.6 | 4.6 | 4.0 | 0.0 | 0.0 | 0.0 |
| Q14 | 0.0 | 0.0 | 0.0 | 4.6 | 4.6 | 4.0 |
| Q16 | 0.0 | 0.0 | 0.0 | 1.4 | 4.8 | 0.8 |
| Q17 | 0.0 | 0.0 | 0.0 | 0.6 | 3.0 | GND |
| Q18 | 0.0 | 0.0 | 0.0 | 5.0 | 0.2 | GND |
| Q21 | 0.0 | 0.0 | 0.0 | ~3.0 | ~5.6 | ~2.4 |
| Q22 | 7.5 | 0.0 | 7.5 | 6.9 | ~7.0 | 7.5 |
| Q24 | 0.0 | 4.5 | GND | 0.0 | 0.0 | GND |
| Q25 | 0.7 | 4.0 | GND | 0.0 | 0.0 | GND |
| Q26 | - | - | - | 0.0 | 0.0 | 0.0 |
| Q27 | 0.7 | NOISE | GND | 0.0 | 0.0 | GND |
| Q33 | 7.2 | 4.0 | 7.5 | 6.9 | 7.5 | 7.5 |
| Q34 | 0.0 | 6.6 | GND | 2.0 | 0.0 | GND |

- NOTE: Q9, 10, 15, 19, 20, 23 and 28 - 32 are not fitted on this model series.
- NOTE: ~ indicates approximate voltage. Actual voltage may vary.

| RECEIVE STATE | | | | | | | |
|---------------|-------|-------|-------|-------|-------|-------|-------|
| PIN # | IC1 | IC2 | IC3 | IC5 | IC6 | IC401 | IC402 |
| 1 | GND | 1.6 | - | 4.0 | 1.4 | 0.0 | 0.0 |
| 2 | GND | 5.0 | - | 3.5 | GND | 1.0 | 0.0 |
| 3 | GND | 5.0 | - | 4.0 | 0.0 | 1.3 | AUDIO |
| 4 | 5.0 | 5.0 | - | 4.1 | GND | 0.0 | 0.0 |
| 5 | GND | 5.0 | - | 3.8 | AUDIO | 0.0 | 5.0 |
| 6 | 7.5 | 0.0 | - | 3.8 | 7.5 | 0.0 | 0.0 |
| 7 | | 0.0 | - | 3.8 | 4.0 | 0.0 | 0.0 |
| 8 | | 0.0 | - | 4.2 | 1.5 | 2.0 | 0.0 |
| 9 | | 5.0 | | AUDIO | | 0.0 | 4.0 |
| 10 | | 2.6 | | 0.8 | | 4.0 | 0.0 |
| 11 | | 2.6 | | 1.0 | | 4.0 | 0.0 |
| 12 | | 5.0 | | 0.0 | | 5.0 | 0.0 |
| 13 | | 3.0 | | 4.0 | | 0.0 | 0.0 |
| 14 | | 5.0 | | GNS | | 5.0 | 5.0 |
| 15 | | 0.0 | | 0.0 | | | |
| 16 | | 0.0 | | 1.8 | | | |
| 17 | | 5.0 | | | | | |
| 18 | | 0.0 | | | | | |
| 19 | | 0.0 | | | | | |
| 20 | | 2.5 | | | | | |
| PIN # | IC404 | IC406 | IC407 | IC408 | IC410 | IC411 | |
| 1 | - | 3.0 | 1.9 | 0.0 | AUDIO | 2.0 | |
| 2 | - | 1.9 | 0.0 | 0.0 | AUDIO | AUDIO | |
| 3 | - | 1.9 | 1.9 | 0.0 | AUDIO | 4.0 | |
| 4 | - | 5.0 | 1.9 | 0.0 | 5.0 | AUDIO | |
| 5 | - | 1.9 | 1.9 | GND | AUDIO | AUDIO | |
| 6 | - | 1.9 | 5.0 | 5.0 | AUDIO | GND | |
| 7 | - | 1.9 | 1.9 | 5.0 | AUDIO | GND | |
| 8 | - | 1.9 | A | 5.0 | AUDIO | GND | |
| 9 | - | 1.9 | CLK | | AUDIO | 0.0 | |
| 10 | - | 1.9 | 0.0 | | AUDIO | 0.0 | |
| 11 | - | GND | 5.0 | | 5.0 | 5.0 | |
| 12 | - | 1.9 | 0.0 | | AUDIO | 0.0 | |
| 13 | - | 1.9 | 1.9 | | AUDIO | 1.9 | |
| 14 | - | 1.9 | 1.9 | | AUDIO | 1.9 | |
| 15 | | | | | | AUDIO | |
| 16 | | | | | | 5.0 | |
| 17 | | | | | | | |
| 18 | | | | | | | |
| 19 | | | | | | | |
| 20 | | | | | | | |

● NOTE: IC4, 403 and 405 are not fitted on this model series.

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| TRANSMIT STATE | | | | | | | |
|----------------|-------|-------|-------|-------|-------|-------|-------|
| PIN # | IC1 | IC2 | IC3 | IC5 | IC6 | IC401 | IC402 |
| 1 | GND | 1.6M | 0.0 | - | 1.3 | 1.9 | 0.0 |
| 2 | GND | 5.0 | 0.0 | - | GND | 1.9 | 0.0 |
| 3 | GND | 5.0 | 0.0 | - | 0.0 | 1.9 | 0.0 |
| 4 | 5.0 | 5.0 | GND | - | GND | 1.9 | 0.0 |
| 5 | GND | 5.0 | - | - | 1.5 | 0.0 | 0.0 |
| 6 | 7.5 | 0.0 | - | - | 7.5 | 0.0 | 0.0 |
| 7 | | 0.0 | - | - | 7.5 | 0.0 | GND |
| 8 | | 0.0 | 5.0 | - | 1.5 | 1.9 | 0.0 |
| 9 | | 5.0 | | - | | 1.9 | 2.1 |
| 10 | | 2.6 | | - | | 2.1 | 0.0 |
| 11 | | 2.6 | | - | | 2.2 | 0.0 |
| 12 | | 5.0 | | - | | 2.2 | 0.0 |
| 13 | | 3.0 | | - | | 5.0 | 0.0 |
| 14 | | 0.0 | | - | | 5.0 | 5.0 |
| 15 | | 0.0 | | | | 5.0 | |
| 16 | | 5.0 | | | | 5.0 | |
| 17 | | 5.0 | | | | | |
| 18 | | 0.0 | | | | | |
| 19 | | 0.0 | | | | | |
| 20 | | 2.5 | | | | | |
| | | | | | | | |
| PIN # | IC404 | IC406 | IC407 | IC408 | IC410 | IC411 | |
| 1 | A | 3.7 | 1.9 | 0.0 | AUDIO | 2.0 | |
| 2 | AUDIO | 1.9 | 0.0 | 0.0 | AUDIO | 4.0 | |
| 3 | AUDIO | 1.9 | 1.9 | 0.0 | AUDIO | 1.9 | |
| 4 | 5.0 | 5.0 | 1.9 | 0.0 | 5.0 | 1.9 | |
| 5 | AUDIO | 1.9 | 1.9 | GND | AUDIO | 0.0 | |
| 6 | AUDIO | 1.9 | 5.0 | 5.0 | AUDIO | GND | |
| 7 | AUDIO | 1.9 | 1.9 | 5.0 | AUDIO | GND | |
| 8 | AUDIO | 1.9 | A | 5.0 | AUDIO | GND | |
| 9 | AUDIO | 1.9 | CLK | | AUDIO | 5.0 | |
| 10 | AUDIO | 1.9 | 0.0 | | AUDIO | 5.0 | |
| 11 | GND | 0.0 | 5.0 | | GND | 0.0 | |
| 12 | AUDIO | 1.9 | 0.0 | | AUDIO | 1.9 | |
| 13 | AUDIO | 1.9 | 1.9 | | AUDIO | 1.9 | |
| 14 | AUDIO | 1.9 | 1.9 | | AUDIO | 0.0 | |
| 15 | | | | | | 0.0 | |
| 16 | | | | | | 5.0 | |
| 17 | | | | | | | |
| 18 | | | | | | | |
| 19 | | | | | | | |
| 20 | | | | | | | |

SP-300 SERIES UHF & VHF DIGITAL SECTION PARTS LIST

| REF# | DESCRIPTION | PART# | REF# | DESCRIPTION | PART# |
|--|---|--------------|---------------|---|--------------|
| DIGITAL SECTION VHF& UHF (COMMON PARTS) | | | C464 | CAP,CER,.033UF,10%,50V,0805 | 100-623-2333 |
| | PTT SWITCH BOARD (SEE NOTE1) | 650-180-0017 | C465 | CAP,CER,.033UF,10%,50V,0805 | 100-623-2333 |
| | FUSE BOARD ASSY | 650-200-0004 | C466 | CAP,CER,.033UF,10%,50V,0805 | 100-623-2333 |
| C136 | CAP,TA,100UF 293D107X0006E2T6V | 102-013-3107 | C467 | CAP,CER,.033UF,10%,50V,0805 | 100-623-2333 |
| C400 | CAP,CER,0.0068UF,50V,5%,X7R,1/16W,0603 | 100-521-1682 | C468 | CAP,CER,.033UF,10%,50V,0805 | 100-623-2333 |
| C404 | CAP,CER,.047UF,0603, | 100-813-1473 | C469 | CAP,CER,.047UF,+80-20%,50V,Y5V,0805 | 100-823-2473 |
| C405 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 | C470 | CAP,CER,1UF,+80-20%,16V,Y5V,0805 | 100-803-2105 |
| C406 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 | C471 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 |
| C413 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C472 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 |
| C414 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C474 | CAP,CER,1UF,+80-20%,16V,Y5V,0805 | 100-803-2105 |
| C415 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C476 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 |
| C416 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C477 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C417 | CAP,CER,220PF,5%,50V,COG,0603 | 100-520-1221 | C478 | CAP,TA,10UF,293D106X0004A2T4V | 102-003-0106 |
| C418 | CAP,CER,220PF,5%,50V,COG,0603 | 100-520-1221 | C479 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C419 | CAP,CER,220PF,5%,50V,COG,0603 | 100-520-1221 | C480 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C420 | CAP,CER,220PF,5%,50V,COG,0603 | 100-520-1221 | C481 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C421 | CAP,CER,220PF,5%,50V,COG,0603 | 100-520-1221 | C482 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C422 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 | C483 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C423 | CAP,TA,10UF,293D106X06R3A2T6.3V | 102-013-0106 | C484 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C424 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C485 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C425 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C701 | CAP,TA,10UF,293D107X0006E2T6V | 102-013-3107 |
| C426 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | CH404 | SW,ROTARY,EC10RP04-66(4Channel) | 830-010-0010 |
| C427 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 | CH404 | SW,ROTARY,EC10RP04-66(16Channel) | 830-010-0011 |
| C428 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | CON401 | CONN, SMTSTRIPS,MMT-104-01-T-SH-P-TR | 140-030-0062 |
| C429 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | CON404 | SKT,14P/SIP,STR,LP,52231-1417 | 140-020-0032 |
| C430 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 | CON406 | PIN,HDR,4P/SIP,R ANG,SHROUD,WAF, | 140-030-0043 |
| C431 | CAP,TA,4.7UF,20%,10V,3216 | 102-023-0475 | CON701 | CONNECTOR SOCKET SSW-106-02-G-D-RA | 140-020-0054 |
| C432 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | D401 | DIODE,SW,KDS181S,SOT-23 | 220-010-0004 |
| C433 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | D402 | DIODE,SW,KDS181S,SOT-23 | 220-010-0004 |
| C434 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 | D403 | DIODE,SW,KDS193,SOT-23 | 220-010-0003 |
| C435 | CAP,CER,0.1UF,10%,50V,X7R,0603 | 100-621-1104 | D404 | DIODE,SW,KDS184S,SOT-23 | 220-010-0002 |
| C436 | CAP,CER,0.022UF,10%,50V,X7R,0603 | 100-621-1223 | D405 | DIODE,ZNR,5.6V,SOT-23,0.225W,MMBZ5232 | 221-010-0056 |
| C437 | CAP,CER,1UF,+80-20%,16V,Y5V,0805 | 100-803-2105 | D406 | DIODE,ZNR,5.6V,SOT-23,0.225W,MMBZ5232 | 221-010-0056 |
| C438 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | D407 | DIODE,ZNR,5.6V,SOT-23,0.225W,MMBZ5232 | 221-010-0056 |
| C439 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | D701 | DIODE,ZNR,5.6V,SOT-23,0.225W,MMBZ5232 | 221-010-0056 |
| C441 | CAP,CER,0.0018UF,50V,10%,X7R,1/16W,0603 | 100-621-1181 | IC401 | IC,SW/MUX,MC14066BDR2,SO-14,A-SW | 444-050-0001 |
| C442 | CAP,CER,0.022UF,10%,50V,X7R,0603 | 100-621-1223 | IC402 | IC,SW/MUX,MC14066BDR2,SO-14,A-SW | 444-050-0001 |
| C443 | CAP,CER,0.0047UF,10%,50V,X7R,0603 | 100-621-1472 | IC404 | IC,OPAMP,KIA324F,SO-14,QUAD | 441-030-0002 |
| C444 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 | IC405 | IC,OPAMP,LM358M,SO-8,DUALOPAMP | 441-030-0006 |
| C446 | CAP,CER,47PF,5%,50V,COG,0603 | 100-520-1470 | IC406 | IC,OPAMP,KIA324F,SO-14,QUAD | 441-030-0002 |
| C448 | CAP,CER,47PF,5%,50V,COG,0603 | 100-520-1470 | IC407 | IC,FILTER,BLP,MF6CWM-100,SO-14 | 441-090-0001 |
| C449 | CAP,CER,0.033UF,10%,16V,X7R,0603 | 100-601-1333 | IC408 | IC,EEPROM,AT93C56-10SI,SO-08,2K,VCC2-5V | 442-010-0003 |
| C452 | CAP,CER,0.1UF,10%,25V,X7R,0805 | 100-611-2104 | IC409 | IC,CPU,OTP,HD4074818H,FP-80A,4BIT | 443-103-0001 |
| C453 | CAP,CER,0.0033UF,50V,10%,X7R,1/16W,0603 | 100-621-1332 | IC410 | IC,OPAMP,KIA324F,SO-14,QUAD | 441-030-0002 |
| C454 | CAP,CER,.68UF,+/-20%,50V,Y5V,0805 | 100-723-2684 | IC411 | IC,A-MUX/DEMUX,MC14053BD,SO-16,3PDT | 440-060-0001 |
| C455 | CAP,CER,.082UF,10%,50V,X7R,0805 | 100-621-2823 | L410 | COILCHIP,10UH:LER015T100K | 371-005-3103 |
| C456 | CAP,CER,120PF,0603,5%,50V | 100-520-1121 | LED1 | LEDCHIP,SML-020MLTT86SMD | 240-030-0035 |
| C458 | CAP,CER,0.1UF,10%,25V,X7R,0805 | 100-611-2104 | Q401 | TRANS,BRT,PNP,KRA110SPK,SOT-23,SW,PK | 870-010-0010 |
| C459 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 | Q403 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| C460 | CAP,CER,15PF,5%,50V,COG,0603 | 100-520-1150 | Q404 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| C461 | CAP,CER,15PF,5%,50V,COG,0603 | 100-520-1150 | Q405 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| C462 | CAP,CER,.047UF,+80-20%,50V,Y5V,0805 | 100-823-2473 | Q406 | TRANS,PNP,BRT,KRA101S,SOT-23,SW,PA | 870-010-0002 |
| C463 | CAP,CER,.047UF,+80-20%,50V,Y5V,0805 | 100-823-2473 | Q407 | TRANS,NPN,KRC101S,BRT,SOT-23 | 870-020-0002 |
| NOTES: | | | Q410 | TRANS,KRA104S,SOT-23 | 870-010-0005 |
| 1. Components are not available,assembly is non-repairable. | | | Q411 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| | | | Q412 | TRANS,KRA104S,SOT-23 | 870-010-0005 |

MAXON
SP-300 HAND HELD

| REF# | DESCRIPTION | PART# | REF# | DESCRIPTION | PART# |
|------|--------------------------------------|--------------|-------|--|--------------|
| Q413 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 | R461 | RES,TF,1M,5%,1/16W,+/-200,0603 | 741-102-1105 |
| Q416 | TRANS,BRT,PNP,KRA110SPK,SOT-23,SW,PK | 870-010-0010 | R464 | RES,TF,4.7K,5%,1/16W,+/-200,0603 | 741-102-1472 |
| Q417 | TRANS,PNP,KTA1504(Y),SOT-23,SW | 870-100-0004 | R469 | RES,TF,2.2K,5%,1/16W,TC250,0603 | 741-102-1222 |
| Q701 | FET, 2SK 1579-TMOS | 870-030-0001 | R470 | RES,30K,1/16W5%T 1608 | 741-102-1303 |
| Q702 | TRANS,,NPN,KTC3875S(BL) | 870-200-0006 | R471 | RES,30K,1/16W5%T 1608 | 741-102-1303 |
| R9 | RES,TF,68,5%,1/10W,TC250,0805 | 741-117-2680 | R472 | RES,36K,1/16W5%T 1608 | 741-102-1363 |
| R9A | RES,TF,68,5%,1/10W,TC250,0805 | 741-117-2680 | R473 | RES,43K,1/10W,5%,T2012 MCR10EZH433J | 741-117-2433 |
| R100 | RES,TF,470,5%,1/16W,TC250,0603 | 741-102-1471 | R474 | RES,43K,1/10W,5%,T2012 MCR10EZH433J | 741-117-2433 |
| R200 | RES,1.2K 1/16W5%T1608 | 741-102-1122 | R475 | RES,TF,47K,5%,1/16W, +/-200,0603 | 741-102-1473 |
| R400 | RES, 9.1K 1/16W 5% T 1608 | 741-102-1912 | R476 | RES,360K,1/10W,5%,T2012 | 741-117-2364 |
| R401 | RES,TF,680K, 5%, 1/16W, +/-200, 0603 | 741-102-1684 | R477 | RES,TF,120K,5%,1/16W, +/-200,0603 | 741-102-1124 |
| R402 | RES,8.2K,1/16W,5%,T 1608 | 741-102-1822 | R483 | RES,TF,2.2K,5%,1/16W,TC250,0603 | 741-102-1222 |
| R403 | RES,8.2K,1/16W,5%,T 1608 | 741-102-1822 | R484 | RES,TF,4.7K,5%,1/16W,+/-200,0603 | 741-102-1472 |
| R404 | RES,8.2K,1/16W,5%,T 1608 | 741-102-1822 | R485 | RES,TF,220K,5%,1/16W,T1608 | 741-102-1224 |
| R405 | RES,TF,100K,5%,1/16W,+/-200,0603 | 741-102-1104 | R487 | RES,TF,120K,5%,1/16W, +/-200,0603 | 741-102-1124 |
| R406 | RES,8.2K,1/16W,5%,T 1608 | 741-102-1822 | R488 | RES,TF, 0.5%,1/16W, +/-200,0603 | 741-102-1000 |
| R408 | RES,TF,22K,5%,1/16W, +/-200,0603 | 741-102-1223 | R489 | RES,TF,4.7K,5%,1/16W,+/-200,0603 | 741-102-1472 |
| R410 | RES,TF,3.3K,5%,1/16W,+/-200,0603 | 741-102-1332 | R490 | RES,TF,2.2K,5%,1/16W,TC250,0603 | 741-102-1222 |
| R411 | RES,TF,270K,1/16W 5%T1608 | 741-102-1274 | R493 | RES,TF,22K,5%,1/16W, +/-200,0603 | 741-102-1223 |
| R412 | RES,TF,22K,5%,1/16W, +/-200,0603 | 741-102-1223 | R701 | RES,TF,2.2K,5%,1/16W,TC250,0603 | 741-102-1222 |
| R414 | RES,TF,10K,5%,1/16W, +/-200,0603 | 741-102-1103 | R702 | RES,TF,12K,5%,1/16W T 1608 | 741-102-1123 |
| R415 | RES,TF,47K,5%,1/16W, +/-200,0603 | 741-102-1473 | R703 | RES,TF,12K,5%,1/16W T 1608 | 741-102-1123 |
| R416 | RES,TF,10K,5%,1/16W, +/-200,0603 | 741-102-1103 | R704 | RES,TF,100K,5%,1/16W,+/-200,0603 | 741-102-1104 |
| R418 | RES,TF,560, 5%,1/16W, +/-200,0603 | 741-102-1561 | RV401 | POT,ROTARY,47K,3MMDIA,SMD | 901-001-0473 |
| R421 | RES,TF,47K,5%,1/16W, +/-200,0603 | 741-102-1473 | RV402 | POT,ROTARY, 22K,SMD | 901-001-0223 |
| R422 | RES,TF,47K,5%,1/16W, +/-200,0603 | 741-102-1473 | RV403 | POT,ROTARY,47K,3MMDIA,SMD | 901-001-0473 |
| R423 | RES,1.2K 1/16W5%T1608 | 741-102-1122 | X401 | XTAL,3.579545MHZ,CP12A,12PF | 162-000-0036 |
| R424 | RES,TF,10K,5%,1/16W, +/-200,0603 | 741-102-1103 | | | |
| R425 | RES,220K,1/16W,5%,T 1608 | 741-102-1224 | | | |
| R426 | RES,1.2K,1/16W,5%,T1608 | 741-102-1122 | | | |
| R427 | RES,TF,100K,5%,1/16W,+/-200,0603 | 741-102-1104 | | | |
| R428 | RES,TF,10K,5%,1/16W, +/-200,0603 | 741-102-1103 | C447 | DIGITAL SECTION(VHFPARTS) CAP,CER,0.022UF,10%,50V,X7R,0603 | 100-621-1223 |
| R429 | RES,27K,1/16W,5%,T1608 | 741-102-1273 | C486 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| R430 | RES,220K,1/16W,5%,T1608 | 741-102-1224 | R409 | RES,TF,150K,5%,1/16W, +/-200,0603 | 741-102-1154 |
| R431 | RES,TF,47K,5%,1/16W, +/-200,0603 | 741-102-1473 | R417 | RES,TF,560, 5%,1/16W, +/-200,0603 | 741-102-1561 |
| R432 | RES,TF,4.7K,5%,1/16W,+/-200,0603 | 741-102-1472 | R459 | RES,1.2K 1/16W5%T1608 | 741-102-1122 |
| R433 | RES,TF,47K,5%,1/16W, +/-200,0603 | 741-102-1473 | R478 | RES,TF,39K,5%,1/16W,TC250,0603 | 741-102-1393 |
| R434 | RES,TF,47K,5%,1/16W, +/-200,0603 | 741-102-1473 | R479 | RES,TF,20K,5%,1/16W,+/-200,0603 | 741-102-1203 |
| R435 | RES,TF,6.8K,5%,1/16W,+/-200,0603 | 741-102-1682 | R480 | RES,TF,10K,5%,1/16W, +/-200,0603 | 741-102-1103 |
| R439 | RES,TF,3K,5%,1/16W,T1608 | 741-102-1302 | R486 | RES,TF,33K,5%,1/16W,+/-200,0603 | 741-102-1333 |
| R440 | RES,TF,4.7K,5%,1/16W,+/-200,0603 | 741-102-1472 | | | |
| R441 | RES,3.9K,1/16W5%T 1608 | 741-102-1392 | | | |
| R442 | RES,27K,1/16W5%T 1608 | 741-102-1273 | | | |
| R443 | RES,TF,2.4K,5%,1/16W,+/-200,0603 | 741-102-1242 | C447 | DIGITAL SECTION(UHF PARTS) CAP,CER,0.0018UF,5%,50V,X7R,0805 | 100-621-2185 |
| R444 | RES,TF, 82K,5%,1/16W,+/-200,0603 | 741-102-1823 | C486 | N/A | |
| R446 | RES,820,1/16W,5%,T1608 | 741-102-1821 | R409 | RES,TF,220K,5%,1/16W,TC250,0603 | 741-107-1224 |
| R447 | RES,220K,1/16W,5%,T1608 | 741-102-1224 | R417 | RES,TF,2.2K,5%,1/16W,TC250,0603 | 741-102-1222 |
| R449 | RES,TF,20K,5%,1/16W,+/-200,0603 | 741-102-1203 | R459 | RES,TF,10K,5%,1/16W, +/-200,0603 | 741-102-1103 |
| R450 | RES,TF,33K,5%,1/16W,+/-200,0603 | 741-102-1333 | R478 | RES,200K,1/16W,5%,T1608 | 741-102-1204 |
| R451 | RES,TF,10K,5%,1/16W, +/-200,0603 | 741-102-1103 | R479 | RES,TF,100K,5%,1/16W,+/-200,0603 | 741-102-1104 |
| R452 | RES,TF,2.2K,5%,1/16W,TC250,0603 | 741-102-1222 | R480 | RES,51K,1/16W,5%,T1608 | 741-102-1513 |
| R453 | RES,TF,1M,5%,1/16W,+/-200,0603 | 741-102-1105 | R486 | RES,18K,1/16W,5%,T1608 | 741-102-1183 |
| R454 | RES,TF,22K,5%,1/16W, +/-200,0603 | 741-102-1223 | | | |
| R456 | RES,TF,22,1/16W,5%,T 1608 | 741-102-1220 | | | |
| R457 | RES,TF,22K,5%,1/16W, +/-200,0603 | 741-102-1223 | | | |
| R460 | RES,TF,47K,5%,1/16W, +/-200,0603 | 741-102-1473 | | | |

SP-300 SERIES VHF RF SECTION PARTS LIST

| REF # | DESCRIPTION | PART # | REF # | DESCRIPTION | PART # |
|----------------------------|-------------------------------------|--------------|-------------|------------------------------------|--------------|
| REPLACEMENT MODULES | | | C59 | CAP,CER,0.47UF GRM40Y5V474Z16VPT | 100-803-2474 |
| | FRONT ENDASSY, VHF(SEE NOTE 1) | 650-110-0012 | C60 | CAP,TA,4.7UF,20%,10V,3216 | 102-023-0475 |
| | VCOTX/RX ASSY, VHF (SEE NOTE 1) | 650-030-0021 | C61 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| | POWERAMPASSY, VHF(SEE NOTE 1) | 650-230-0012 | C62 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| | TCXO ASSY, VHF(SEE NOTE 1) | 650-100-0002 | C63 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 |
| COMPONENTS | | | C64 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C1 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 | C65 | CAP,TA,10UF,20%,10V,B,3528 | 102-023-1106 |
| C2 | CAP,TA,10UF,293D106X06R3A2T6.3V | 102-013-0106 | C66 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C3 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 | C67 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C4 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 | C68 | CAP,CER,0.001UF,5%,50V,COG,0805 | 100-520-2102 |
| C5 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C70 | CAP,CER,1UF,+80-20%,16V,Y5V,0805 | 100-803-2105 |
| C6 | CAP,TA,4.7UF,20%,10V,3216 | 102-023-0475 | C72 | CAP,CER,6PF,0.5PF,50V,COG,0805 | 100-120-2060 |
| C7 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 | C73 | CAP,CER,30PF,5%,50V,COG,0805 | 100-520-2300 |
| C8 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C74 | CAP,CER,36PF GRM40COG360J50VPT | 100-520-2360 |
| C9 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 | C75 | CAP,CER,24PF,5%,50V,COG,0805 | 100-520-2240 |
| C11 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 | C76 | CAP,CER,9PF,0.5PF,50V,COG,0805 | 100-020-2090 |
| C12 | CAP,TA,10UF,293D106X06R3A2T6.3V | 102-013-0106 | C77 | CAP,CER,0.001UF,5%,50V,COG,0805 | 100-520-2102 |
| C13 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 | C78 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C14 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C79 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 |
| C15 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 | C81 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C16 | CAP,CER,2PF,.25%,50V,COG,0603 | 100-020-1020 | C82 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C17 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 | C83 | CAP,CER,7PF,.5PF,50V,COG,0603 | 100-120-1070 |
| C18 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 | C84 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 |
| C19 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C86 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C20 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C87 | CAP,CER,27PF,5%,50V,COG,0603 | 100-520-1270 |
| C21 | CAP,METAL,POLY,0.33UF,63VBOX | 083-013-2334 | C88 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 |
| C22 | CAP,METAL,POLY,.022UF,63VBOX | 083-013-2223 | C90 | CAP,CER,7PF,.5PF,50V,COG,0603 | 100-120-1070 |
| C23 | CAP,MYLAR,.01UF,63VKBOXTYPE | 083-014-2103 | C92 | CAP,CER,18PF,5%,50V,COG,0603 | 100-520-1180 |
| C24 | CAP,MYLAR,.01UF,63VKBOXTYPE | 083-014-2103 | C93 | CAP,CER,82PF,5%,COG,50V,0603 | 100-520-1820 |
| C25 | CAP,CER,1UF,+80-20%,16V,Y5V,0805 | 100-803-2105 | C94 | CAP,CER,1UF,+80-20%,16V,Y5V,0805 | 100-803-2105 |
| C26 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 | C95 | CAP,TA,4.7UF,20%,10V,3216 | 102-023-0475 |
| C34 | CAP,CER,220PF,5%,50V,COG,0603 | 100-520-1221 | C96 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 |
| C35 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 | C97 | CAP,CER,30PF,5%,50V,COG,0603 | 100-520-2300 |
| C36 | CAP,CER,14PF,5%,50V,COG,0805 | 100-520-2140 | C98 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 |
| C37 | CAP,CER,33PF,5%,50V,COG,0603 | 100-520-1330 | C102 | CAP,CER,0.1UF,10%,25V,X7R,0805 | 100-611-2104 |
| C38 | CAP,CER,43PF GRM40COG430J50VPT | 100-520-2430 | C103 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C39 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 | C104 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 |
| C42 | CAP,CER,0.001UF,5%,50V,COG,0805 | 100-520-2102 | C105 | CAP,CER,47PF,5%,50V,COG,0603 | 100-520-1470 |
| C43 | CAP,CER,3PF,.25PF,50V,COG,0603 | 100-020-1030 | C106 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 |
| C44 | CAP,TA,4.7UF,20%,10V,3216 | 102-023-0475 | C107 | CAP,CER,10PF,.5%,50V,COG,0603 | 100-120-1100 |
| C45 | CAP,CER,10PF,.5%,50V,COG,0603 | 100-120-1100 | C108 | CAP,CER,.0015UF,GRM39X7R152K50VPT | 100-621-1151 |
| C46 | CAP,CER,8PF,50V,.5PF,COG,1/16W,0603 | 100-120-1080 | C109 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C47 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C111 | CAP,CER,0.1UF,10%,25V,X7R,0805 | 100-611-2104 |
| C50 | CAP,CER,33PF,5%,50V,COG,0603 | 100-520-1330 | C112 | CAP,CER,0.033UF,10%,16V,X7R,0603 | 100-601-1333 |
| C51 | CAP,CER,10PF,5%,50V,COG,0603 | 100-120-1100 | C113 | CAP,CER,0.1UF,10%,25V,X7R,0805 | 100-611-2104 |
| C53 | CAP,CER,1UF,+80-20%,16V,Y5V,0805 | 100-803-2105 | C114 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 |
| C54 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 | C115 | CAP,CER,220PF,5%,50V,COG,0603 | 100-520-1221 |
| C55 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 | C116 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 |
| C57 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C117 | CAP,CER,47PF,5%,50V,COG,0603 | 100-520-1470 |
| C58 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C118 | CAP,CER,33PF,5%,50V,COG,0603 | 100-520-1330 |
| | | | C121 | CAP,CER,20PF,5%,50V,COG,0603 | 100-520-1200 |
| | | | C122 | CAP,CER,0.001UF,5%,50V,COG,0805 | 100-520-2102 |
| | | | C123 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 |
| | | | C124 | CAP,CER,0.1UF,10%,25V,X7R,0805 | 100-611-2104 |
| | | | C125 | CAP,CER,0.1UF,10%,25V,X7R,0805 | 100-611-2104 |
| | | | C126 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 |
| | | | C127 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 |

NOTES:

1. Components are not available,assembly is non-repairable.

MAXON

SP-300 HAND HELD

| REF # | DESCRIPTION | PART # | REF # | DESCRIPTION | PART # |
|--------|--|--------------|-------|--|--------------|
| C128 | CAP,TA,10UF,20%,16V,3216 | 102-023-1106 | L17 | COIL,CHIP, 1000U,300SS-102K=CP3 | 370-013-4102 |
| C129 | CAP,ELE,10UF,16V20%3X5 5.0PT | 081-032-3106 | L18 | COIL,CHIP, 1.0UH:NL252018T-1R0J | 371-017-3102 |
| C131 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 | L19 | COILCHIP,10UH:LER015T100K | 371-005-3103 |
| C132 | CAP,TA,4.7UF,20V,3528:293D475X0020B2T20V | 102-043-1475 | Q1 | TRANS,BRT,PNP,KRA102SPB,SOT-23,SW,(PB) | 870-010-0007 |
| C133 | CAP,TA,1.0UF,20%,16V,3216 | 102-033-0105 | Q2 | TRANS,BRT,PNP,KRA110SPK,SOT-23,SW,PK | 870-010-0010 |
| C134 | CAP, CER, .047UF,0603, | 100-813-1473 | Q3 | TRANS,BRT,PNP,KRA110SPK,SOT-23,SW,PK | 870-010-0010 |
| C135 | CAP, TA,10UF, 293D106X0004A2T4V | 102-003-0106 | Q4 | TRANS,BRT,PNP,KRA110SPK,SOT-23,SW,PK | 870-010-0010 |
| C136 | CAP, TA, 100UF, 20%, 6.3V, D | 102-013-3107 | Q5 | TRANS,KRA104S,SOT-23 | 870-010-0005 |
| C137 | CAP, CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | Q6 | TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL) | 870-200-0006 |
| C145 | CAP, CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | Q7 | TRANS,PNP,KTA1504(Y),SOT-23,SW | 870-100-0004 |
| C146 | CAP, CER,220PF,5%,50V,COG,0603 | 100-520-1221 | Q8 | TRANS,PNP,KTA1504(Y),SOT-23,SW | 870-100-0004 |
| C901 | CAP, CER, 0.01UF,5%,50V,X7R,0603 | 100-521-1103 | Q11 | TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL) | 870-200-0006 |
| C902 | CAP, CER, 0.01UF,5%,50V,X7R,0603 | 100-521-1103 | Q12 | TRANS,NPN,BFR92A,SOT-23,RFAMP,(P2P) | 870-200-0020 |
| C903 | CAP, CER, 0.01UF,5%,50V,X7R,0603 | 100-521-1103 | Q13 | TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL) | 870-200-0006 |
| C904 | CAP, CER, 0.01UF,5%,50V,X7R,0603 | 100-521-1103 | Q14 | TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL) | 870-200-0006 |
| C905 | CAP, CER,18PF,5%,50V,COG,0603 | 100-520-1180 | Q16 | TRANS,900MHZ AMP,MMB1321Q4LT1,SOT-23 | 870-200-0008 |
| C906 | CAP, CER,18PF,5%,50V,COG,0603 | 100-520-1180 | Q17 | TRANS,900MHZ AMP,MMB1321Q4LT1,SOT-23 | 870-200-0008 |
| C907 | CAP, CER, 0.1UF,5%,25V,X7R,0603 | 100-813-1104 | Q18 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| C908 | CAP,CER,33PF,5%,50V,COG,0603 | 100-520-1330 | Q19 | TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL) | 870-200-0006 |
| C910 | CAP, CER, 0.01UF,5%,50V,X7R,0603 | 100-521-1103 | Q21 | TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL) | 870-200-0006 |
| C911 | CAP, CER, 0.01UF,5%,50V,X7R,0603 | 100-521-1103 | Q22 | TRANS,PNP,KTA1663(Y),SOT-89,HC/SW,(HY) | 870-150-0002 |
| C999 | CAP,CER,20PF,5%,50V,COG,0603 | 100-520-1200 | Q23 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| CF1 | FILTER CERAMIC LT-455FW | 310-101-0010 | Q24 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| CF2 | FILTER, CER,CF455HT,455KHZ | 310-101-0013 | Q25 | TRANS,NPN,BFR92A,SOT-23,RFAMP,(P2P) | 870-200-0020 |
| CON701 | CONNECTOR SOCKET,SSW-106-02-G-D-RA | 140-020-0054 | Q26 | TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL) | 870-200-0006 |
| D1 | DIODE,SW,KDS181S,SOT-23 | 220-010-0004 | Q27 | TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL) | 870-200-0006 |
| D5 | DIODE,PIN,UPP9401,NEEDPKG SIZE | 220-020-0001 | Q28 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| D6 | DIODE,PIN,UPP9401,NEEDPKG SIZE | 220-020-0001 | Q31 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| D8 | DIODE,SW,KDS193,SOT-23 | 220-010-0003 | Q32 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| D9 | DIODEVARICAPCHIP ND433G 5V (SOP-08) | 220-040-0009 | Q33 | TRANS,PNP,KTA1504(Y),SOT-23,SW | 870-100-0004 |
| D11 | DIODE,SW,KDS193,SOT-23 | 220-010-0003 | Q34 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| D12 | DIODE,SW,KDS193,SOT-23 | 220-010-0003 | Q901 | TRANS,NPN,KTC4075,UMT3 | 870-200-0031 |
| D13 | DIODE,SW,KDS181S,SOT-23 | 220-010-0004 | Q902 | TRANS,KTA2014,MAX-900K | 870-100-0018 |
| D14 | DIODE,SW,KDS181S,SOT-23 | 220-010-0004 | Q903 | TRANS,NPN,KTC4075,UMT3 | 870-200-0031 |
| D15 | DIODE, CHIP,SM4004,400V,1A,SMD | 220-030-0003 | Q904 | TRANS,NPN,KTC4075,UMT3 | 870-200-0031 |
| D17 | DIODE,SCHOTTKY,CHIP,PRLL5817,SOD87 | 220-040-0008 | Q905 | TRANS,NPN,KTC4075,UMT3 | 870-200-0031 |
| D18 | DIODE,KDS160 | 220-010-0017 | R1 | RES,TF,10K,5%,1/16W,+/-200,0603 | 741-102-1103 |
| D20 | DIODE,KDS160 | 220-010-0017 | R2 | RES,TF,100K,5%,1/16W,+/-200,0603 | 741-102-1104 |
| D901 | DIODE,SW,KDS226,SOT-23 | 220-010-0005 | R3 | RES,TF,2.2K,5%,1/16W,TC250,0603 | 741-102-1222 |
| D902 | DIODE,SW,KDS226,SOT-23 | 220-010-0005 | R4 | RES,1.8K,1/16W,5%,T 1608 | 741-102-1182 |
| FUSE1 | FUSE,60V,4A,25NM-040-L | 700-020-0002 | R5 | RES,1.8K,1/16W,5%,T 1608 | 741-102-1182 |
| IC1 | IC,VREG,TK11450M,+5V,SOT-23L,(R5) | 441-010-0002 | R6 | RES,TF,2K, 1/16W,5%,T 1608 | 741-102-1202 |
| IC2 | IC,PLL,MC145193FR2,SO-20,RS-440 | 440-050-0011 | R7 | RES,1.8K,1/16W,5%,T 1608 | 741-102-1182 |
| IC3 | IC,OPAMP,LM358M,SO-8,DUALOPAMP | 441-030-0006 | R8 | RES,910,1/10W,5%,T 2012 | 741-117-2911 |
| IC5 | IC,VHFRVCVR,MC3371D,SO-16,NWRBAND | 441-060-0007 | R11 | RES,TF,100, 5%,1/16W, +/-200,0603 | 741-102-1101 |
| IC6 | IC,AUDIOAMP,LM386M-1,0.33W,SO-8 | 441-040-0002 | R12 | RES,TF,5.6K,5%,1/16W,T1608 | 741-102-1562 |
| L1 | COIL,CHIP,47NH,20%,LL2012-F47NM | 371-010-5470 | R13 | RES,TF,2.7K,5%,1/16W,+/-200,0603 | 741-102-1272 |
| L3 | COIL,1.2UH:NL252018T-1R2J | 371-004-31R2 | R14 | RES,TF,2.7K,5%,1/16W,+/-200,0603 | 741-102-1272 |
| L4 | COIL,0.1UH:NL252018T-R10J | 371-804-3R10 | R15 | RES,TF,100, 5%,1/16W, +/-200,0603 | 741-102-1101 |
| L5 | COIL,0.1UH:NL252018T-R10J | 371-804-3R10 | R16 | RES,910,1/10W,5%,T 2012 | 741-117-2911 |
| L6 | COIL,CHIP, 1.0UH:NL252018T-1R0J | 371-017-3102 | R17 | RES,TF,12K,5%,1/16W, +/-200,0603 | 741-102-1123 |
| L7 | COILSPRING 3X0.55X4T:LSMD | 350-000-0104 | R21 | RES,TF,100, 5%,1/16W, +/-200,0603 | 741-102-1101 |
| L8 | COILSPRING 3X0.55X4T:LSMD | 350-000-0104 | R22 | RES,TF,4.7K,5%,1/16W,+/-200,0603 | 741-102-1472 |
| L11 | COILSPRING 3X0.55X4T:LSMD | 350-000-0104 | R23 | RES,120 1/16W5%T 1608 | 741-102-1121 |
| L13 | COILSPRING 2.8X0.4X8T:L | 350-000-0106 | R24 | RES,5.6K,1/16W,5%,T 1608 | 741-102-1562 |
| L14 | COILCHIP,0.68UH:NL252018T-R68J | 371-313-3681 | R25 | RES,TF,3.3K,5%,1/16W,+/-200,0603 | 741-102-1332 |
| L15 | COILCHIP,0.15UH:NL252018T-R15J | 371-004-3R15 | R26 | RES,TF,18,1/16W, 5%,T 1608 | 741-102-1180 |
| L16 | COIL,CHIP, 1000U,300SS-102K=CP3 | 370-013-4102 | R27 | RES,TF,4.7K,5%,1/16W,+/-200,0603 | 741-102-1472 |
| | | | R28 | RES,56,1/16W, 5%,T 1608 | 741-102-1560 |
| | | | R35 | RES,8.2K,1/16W,5%,T 1608 | 741-102-1822 |

MAXON

SP-300 HAND HELD

| REF # | DESCRIPTION | PART # | REF # | DESCRIPTION | PART # |
|-------|-----------------------------------|--------------|-------|---|--------------|
| R31 | RES,TF,300,1/16W,5%,T 1608 | 741-102-1301 | R95 | RES,TF,82K,5%,1/16W,+/-200,0603 | 741-102-1823 |
| R32 | RES,TF,300,1/16W,5%,T 1608 | 741-102-1301 | R96 | RES,TF,39K,5%,1/16W,TC250,0603 | 741-102-1393 |
| R33 | RES,TF,3.3K,5%,1/16W,+/-200,0603 | 741-102-1332 | R97 | RES,TF,10, 5%,1/16W, +/-200,0603 | 741-102-1100 |
| R34 | RES,TF,18,1/16W, 5%,T 1608 | 741-102-1180 | R98 | RES,TF,10K,5%,1/16W, +/-200,0603 | 741-102-1103 |
| R36 | RES,TF, 0,5%,1/16W, +/-200,0603 | 741-102-1000 | R99 | RES,TF,100K,5%,1/16W,+/-200,0603 | 741-102-1104 |
| R37 | RES,TF,3.3K,5%,1/16W,+/-200,0603 | 741-102-1332 | R102 | RES,TF,22K,5%,1/16W, +/-200,0603 | 741-102-1223 |
| R41 | RES,TF,100, 5%,1/16W, +/-200,0603 | 741-102-1101 | R103 | RES,TF,10K,5%,1/16W, +/-200,0603 | 741-102-1103 |
| R42 | RES,TF,12K,5%,1/16W, +/-200,0603 | 741-102-1123 | R104 | RES,TF,10K,5%,1/16W, +/-200,0603 | 741-102-1103 |
| R43 | RES,TF,10K,5%,1/16W, +/-200,0603 | 741-102-1103 | R105 | RES,TF,30K,5%,1/16W, +/-200,0603 | 741-102-1303 |
| R45 | RES,TF,12K,5%,1/16W, +/-200,0603 | 741-102-1123 | R106 | RES,TF,22K,5%,1/16W, +/-200,0603 | 741-102-1223 |
| R46 | RES,2.2K,1/16W5%T 1608 | 741-102-1222 | R108 | RES,TF,56K,1/16W,5%,T 1608,0603 | 741-102-1563 |
| R47 | RES,TF,2.2,5%,1/10W,TC250,0805 | 741-117-2229 | R109 | RES,0.1,1W1% 1218 | 740-521-0R10 |
| R48 | RES,TF,2.2,5%,1/10W,TC250,0805 | 741-117-2229 | R110 | RES,TF,270, 5%,1/16W,+/-200,0603 | 741-102-1271 |
| R49 | RES,TF,22,1/16W,5%,T 1608 | 741-102-1220 | R111 | RES,TF,10K,5%,1/16W, +/-200,0603 | 741-102-1103 |
| R50 | RES,TF,1M,5%,1/16W,+/-200,0603 | 741-102-1105 | R112 | RES,TF,22K,5%,1/16W, +/-200,0603 | 741-102-1223 |
| R51 | RES,TF,2.2,5%,1/10W,TC250,0805 | 741-117-2229 | R113 | RES,TF,470K,5%,1/16W,TC1608,0603 | 741-102-1474 |
| R52 | RES,TF,3.3K,5%,1/16W,+/-200,0603 | 741-102-1332 | R114 | RES,TF,100K,5%,1/16W,+/-200,0603 | 741-102-1104 |
| R53 | RES,TF,10K,5%,1/16W, +/-200,0603 | 741-102-1103 | R115 | RES,TF,22,1/16W,5%,T 1608 | 741-102-1220 |
| R54 | RES,TF,1K,5%,1/16W,+/-200,0603 | 741-102-1102 | R116 | RES,TF,22K,5%,1/16W, +/-200,0603 | 741-102-1223 |
| R55 | RES,TF,1.5K,5%,1/16W,+/-200,0603 | 741-102-1152 | R117 | RES,TF,22K,5%,1/16W, +/-200,0603 | 741-102-1223 |
| R56 | RES,270 1/16W5%T 1608 | 741-102-1271 | R121 | RES,TF,220K,5%,1/16W,1608 | 741-102-1224 |
| R57 | RES,TF,100K,5%,1/16W,+/-200,0603 | 741-102-1104 | R122 | RES,TF,4.7K,5%,1/16W,+/-200,0603 | 741-102-1472 |
| R58 | RES,TF,470K,5%,1/16W,TC1608,0603 | 741-102-1474 | R123 | RES,TF, 0,5%,1/16W, +/-200,0603 | 741-102-1000 |
| R59 | RES,TF,39,5%,50V,0603 | 741-102-1390 | R125 | RES,TF,22,1/16W,5%,T 1608 | 741-102-1220 |
| R61 | RES,68K 1/16W1%T1608 | 740-211-1683 | R130 | RES,TF,100, 5%,1/16W, +/-200,0603 | 741-102-1101 |
| R62 | RES,68K 1/16W1%T1608 | 740-211-1683 | R135 | RES,TF,4.7M,5%,1/16W,+/-200,0603 | 741-102-1475 |
| R63 | RES,TF,150,5%,1/16W,+/-200,0603 | 741-102-1151 | R901 | RES,TF,2.2K,5%,1/16W,TC250,0603 | 741-102-1222 |
| R64 | RES,TF,22,1/16W,5%,T 1608 | 741-102-1220 | R902 | RES,TF,2.2K,5%,1/16W,TC250,0603 | 741-102-1222 |
| R65 | RES,51,1/16W, 5%,T 1608 | 741-102-1510 | R903 | RES,TF,4.7K,5%,1/16W,+/-200,0603 | 741-102-1472 |
| R66 | RES,TF,100, 5%,1/16W, +/-200,0603 | 741-102-1101 | R904 | RES,TF,7.5K,5%,1/16W,50V,T1608,0603 | 741-102-1752 |
| R67 | RES,TF,22K,5%,1/16W, +/-200,0603 | 741-102-1223 | R905 | RES,27K,1/16W5%T 1608 | 741-102-1273 |
| R68 | RES,TF,22K,5%,1/16W, +/-200,0603 | 741-102-1223 | R906 | RES,TF,7.5K,5%,1/16W,50V,T1608,0603 | 741-102-1752 |
| R69 | RES,TF,470K,5%,1/16W,TC1608,0603 | 741-102-1474 | R907 | RES,27K,1/16W5%T 1608 | 741-102-1273 |
| R70 | RES,TF,470K,5%,1/16W,TC1608,0603 | 741-102-1474 | R908 | RES,TF,10, 5%,1/16W, +/-200,0603 | 741-102-1100 |
| R71 | RES,TF,1K,5%,1/16W,+/-200,0603 | 741-102-1102 | R909 | RES,TF,470,5%,1/16W,TC250,0603 | 741-102-1471 |
| R72 | RES,TF,220K,5%,1/16W,TC1608,0603 | 741-102-1224 | RC56 | RES,TF, 0,5%,1/16W, +/-200,0603 | 741-102-1000 |
| R74 | RES,TF,22K,5%,1/16W, +/-200,0603 | 741-102-1223 | RL2 | RES,TF, 0,5%,1/16W, +/-200,0603 | 741-102-1000 |
| R75 | RES,TF,47K,5%,1/16W, +/-200,0603 | 741-102-1473 | RLK2 | RES,TF, 0,5%,1/16W, +/-200,0603 | 741-102-1000 |
| R76 | RES,TF,22K,5%,1/16W, +/-200,0603 | 741-102-1223 | RLK3 | RES,TF, 0,5%,1/16W, +/-200,0603 | 741-102-1000 |
| R77 | RES,TF,22K,5%,1/16W, +/-200,0603 | 741-102-1223 | RLK4 | RES,TF, 0,5%,1/16W, +/-200,0603 | 741-102-1000 |
| R78 | RES,TF,2.7K,5%,1/16W,+/-200,0603 | 741-102-1272 | RLK5 | RES,TF, 0,5%,1/16W, +/-200,0603 | 741-102-1000 |
| R79 | RES,56,1/16W, 5%,T 1608 | 741-102-1560 | RLK7 | RES,TF, 0,5%,1/16W, +/-200,0603 | 741-102-1000 |
| R81 | RES,TF,2.7K,5%,1/16W,+/-200,0603 | 741-102-1272 | RLK12 | RES,TF, 0,5%,1/16W, +/-200,0603 | 741-102-1000 |
| R82 | RES,TF,10K,5%,1/16W, +/-200,0603 | 741-102-1103 | RLK16 | RES,TF, 0,5%,1/16W, +/-200,0603 | 741-102-1000 |
| R83 | RES,TF,18K,1/16W5%T 1608 | 741-102-1183 | RV1 | RES,SEMIFIXED,10KB RH0651C100103 | 901-002-0103 |
| R84 | RES,TF,18K,1/16W5%T 1608 | 741-102-1183 | RV2 | POT,ROTARY, 1K, 3DIAMM,SMD | 901-001-0102 |
| R85 | RES,TF,39K,5%,1/16W,TC250,0603 | 741-102-1393 | RV3 | RES,SEMIFIXED,10KB RH0651C100103 | 901-002-0103 |
| R86 | RES,TF,1K,5%,1/16W,+/-200,0603 | 741-102-1102 | RV4 | POT,ROTARY, 1K, 3DIAMM,SMD | 901-001-0102 |
| R87 | RES,TF,330K,5%,1/16W,+/-200,0603 | 741-102-1334 | T1 | COIL,IFT,SMD,455KHZQUAD | 353-012-0001 |
| R88 | RES,TF,100, 5%,1/16W, +/-200,0603 | 741-102-1101 | T2 | TRANSFORMERSCHIP 617PT-1019 | 840-010-0002 |
| R89 | RES,TF,22,1/16W,5%,T 1608 | 741-102-1220 | T3 | TRANSFORMERSCHIP 617PT-1019 | 840-010-0002 |
| R91 | RES,TF,470,5%,1/16W,TC250,0603 | 741-102-1471 | TH1 | THERM,33K,NTCCS32163SH333KC | 700-050-0002 |
| R92 | RES,TF,2.7K,5%,1/16W,+/-200,0603 | 741-102-1272 | VR3 | POT,20K,RK097111120KA | 901-002-0203 |
| R93 | RES,TF, 0,5%,1/16W, +/-200,0603 | 741-102-1000 | X1 | CRYSTAL,44.645M-3015PM,32P,RX 3RD,HC-45 | 168-044-6450 |
| R94 | RES,TF,1K,5%,1/16W,+/-200,0603 | 741-102-1102 | XF1 | FILTER,CRYSTAL,KFN1045AA(45.1M) (BMO-U) | 310-030-0015 |

MAXON

SP-300 HAND HELD

SP-300 SERIES UHF RF SECTION PARTS LIST

| REF # | DESCRIPTION | PART # | REF # | DESCRIPTION | PART # |
|----------------------------|------------------------------------|--------------|-------------|------------------------------------|--------------|
| REPLACEMENT MODULES | | | C57 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| | FRONT ENDASSY, UHF (SEE NOTE 1) | 650-110-0013 | C58 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| | VCOTX/RX ASSY, UHF (SEE NOTE 1) | 650-030-0020 | C59 | CAP,CER,0.47UF GRM40Y5V474Z16VPT | 100-803-2474 |
| | POWERAMPASSY, UHF (SEE NOTE 1) | 650-230-0013 | C60 | CAP,TA,4.7UF,20%,10V,3216 | 102-023-0475 |
| COMPONENTS | | | C61 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C1 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C62 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C2 | CAP,TA,10UF,293D106X06R3A2T6.3V | 102-013-0106 | C63 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 |
| C3 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C64 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C4 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C65 | CAP,TA,10UF,20%,10V,B,3528 | 102-023-1106 |
| C5 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C66 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C6 | CAP,TA,4.7UF,20%,10V,3216 | 102-023-0475 | C67 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C7 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C68 | CAP,CER,27PF,5%,50V,COG,0805 | 100-520-2270 |
| C8 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C70 | CAP,CER,1UF,+80-20%,16V,Y5V,0805 | 100-803-2105 |
| C9 | CAP,CER,0.01UF,10%,50V,X7R,0805 | 100-621-2103 | C73 | CAP,CER,3PF,0.25PF,50V,COG,0805 | 100-020-2030 |
| C11 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 | C74 | CAP,CER,8PF,.25PF%,COG,50V,0805 | 100-120-2080 |
| C12 | CAP,TA,10UF,293D106X06R3A2T6.3V | 102-013-0106 | C75 | CAP,CER,4.7PF GRM40COG4R7C50VPT | 100-120-24R7 |
| C13 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 | C77 | CAP,CER,470PF,10%,50V,X7R,0805 | 100-621-2471 |
| C14 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C78 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C15 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 | C79 | CAP,CER,0.1UF,10%,25V,X7R,0805 | 100-611-2104 |
| C16 | CAP,CER,2PF,.25%,50V,COG,0603 | 100-020-1020 | C81 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C17 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 | C82 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C18 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 | C83 | CAP,CER,12PF,5%,50V,COG,0603 | 100-520-1120 |
| C19 | CAP,CER,220PF,5%,50V,COG,0603 | 100-520-1221 | C84 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C20 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C86 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C21 | CAP,METAL,POLY,0.33UF,63VBOX | 083-013-2334 | C87 | CAP,CER,22PF,5%,50V,COG,0603 | 100-520-1220 |
| C22 | CAP,METAL,POLY,.022UF,63VBOX | 083-013-2223 | C88 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 |
| C23 | CAP,MYLAR,.01UF,63VKBOXTYPE | 083-014-2103 | C90 | CAP,CER,7PF,.5PF,50V,COG,0603 | 100-120-1070 |
| C24 | CAP,MYLAR,.01UF,63VKBOXTYPE | 083-014-2103 | C92 | CAP,CER,30PF,5%,50V,COG,0603 | 100-520-1300 |
| C25 | CAP,CER,1UF,+80-20%,16V,Y5V,0805 | 100-803-2105 | C93 | CAP,CER,82PF,5%,COG,50V,0603 | 100-520-1820 |
| C26 | CAP,CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 | C94 | CAP,CER,1UF,+80-20%,16V,Y5V,0805 | 100-803-2105 |
| C34 | CAP,CER,220PF,5%,50V,COG,0603 | 100-520-1221 | C95 | CAP,TA,4.7UF,20%,10V,3216 | 102-023-0475 |
| C35 | CAP,CER,220PF,5%,50V,COG,0603 | 100-520-1221 | C96 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 |
| C36 | CAP,CER,7PF,0.5PF,50V,COG,0805 | 100-110-2070 | C97 | CAP,CER,30PF,5%,50V,COG,0603 | 100-520-1300 |
| C37 | CAP,CER,5.6PF,.25PF,50V,COG,0603 | 100-020-15R6 | C98 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 |
| C38 | CAP,CER,15PF,5%,50V,COG,0805 | 100-520-2150 | C102 | CAP,CER,0.1UF,10%,25V,X7R,0805 | 100-611-2104 |
| C39 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C103 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C41 | CAP,CER,6PF,0.5PF,50V,COG,0805 | 100-120-2060 | C104 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 |
| C42 | CAP,CER,27PF,5%,50V,COG,0805 | 100-520-2270 | C105 | CAP,CER,47PF,5%,50V,COG,0603 | 100-520-1470 |
| C43 | CAP,CER,5PF,.25PF,50V,COG,0603 | 100-020-1050 | C106 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 |
| C44 | CAP,TA,4.7UF,20%,10V,3216 | 102-023-0475 | C107 | CAP,CER,10PF,.5%,50V,COG,0603 | 100-120-1100 |
| C45 | CAP,CER,220PF,5%,50V,COG,0603 | 100-520-1221 | C108 | CAP,CER,.0015UF,GRM39X7R152K50VPT | 100-621-1151 |
| C46 | CAP,CER,3PF,.25PF,50V,COG,0603 | 100-020-1030 | C109 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 |
| C47 | CAP,CER,220PF,5%,50V,COG,0603 | 100-520-1221 | C111 | CAP,CER,0.1UF,10%,25V,X7R,0805 | 100-611-2104 |
| C49 | CAP,CER,2PF,0.25PF%,50V,COG,0805 | 100-020-2020 | C112 | CAP,CER,0.033UF,10%,16V,X7R,0603 | 100-601-1333 |
| C50 | CAP,CER,12PF,5%,50V,COG,0603 | 100-520-1120 | C113 | CAP,CER,0.1UF,10%,25V,X7R,0805 | 100-611-2104 |
| C51 | CAP,CER,6PF,.25PF,50V,COG,0603 | 100-020-1060 | C114 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 |
| C53 | CAP,CER,1UF,+80-20%,16V,Y5V,0805 | 100-803-2105 | C115 | CAP,CER,220PF,5%,50V,COG,0603 | 100-520-1221 |
| C54 | CAP,CER,220PF,5%,50V,COG,0603 | 100-520-1221 | C116 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 |
| C55 | CAP,CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | C117 | CAP,CER,47PF,5%,50V,COG,0603 | 100-520-1470 |
| C56 | CAP,CER,12PF,5%,50V,COG,0603 | 100-520-1120 | C118 | CAP,CER,33PF,5%,50V,COG,0603 | 100-520-1330 |
| | | | C121 | CAP,CER,20PF,5%,50V,COG,0603 | 100-520-1200 |
| | | | C122 | CAP,CER,0.001UF,10%,50V,X7R,0603 | 100-621-1102 |
| | | | C123 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 |
| | | | C124 | CAP,CER,0.1UF,10%,25V,X7R,0805 | 100-611-2104 |
| | | | C125 | CAP,CER,0.1UF,10%,25V,X7R,0805 | 100-611-2104 |
| | | | C126 | CAP,CER,0.01UF,5%,50V,X7R,0603 | 100-521-1103 |

NOTES:

1. Components are not available,assembly is non-repairable.

MAXON

SP-300 HAND HELD

| REF # | DESCRIPTION | PART # | REF # | DESCRIPTION | PART # |
|-------|--|--------------|-------|--|--------------|
| C127 | CAP, CER, 0.01UF,5%,50V,X7R,0603 | 100-521-1103 | L15 | COILCHIP,0.15UH:NL252018T-R15J | 371-004-3R15 |
| C128 | CAP, TA, 4.7UF,20%,10V,3216 | 102-023-0475 | L16 | COIL,CHIP, 1000U,300SS-102K=CP3 | 370-013-4102 |
| C129 | CAP, ELE,10UF,16V 20% 3X5 5.0PT | 081-032-3106 | L17 | COIL,CHIP, 1000U,300SS-102K=CP3 | 370-013-4102 |
| C131 | CAP, CER, 0.01UF,5%,50V,X7R,0603 | 100-521-1103 | L18 | COIL,CHIP, 1.0UH:NL252018T-1R0J | 371-017-3102 |
| C132 | CAP, TA,4.7UF,20V,3528:293D475X0020B2T 20V | 102-043-1475 | L19 | COILCHIP,10UH:LER015T100K | 371-005-3103 |
| C133 | CAP,TA,1.0UF,20%,16V,3216 | 102-033-0105 | Q1 | TRANS,BRT,PNP,KRA102SPB,SOT-23,SW,(PB) | 870-010-0007 |
| C134 | CAP, CER,,047UF,0603, | 100-813-1473 | Q2 | TRANS,BRT,PNP,KRA110SPK,SOT-23,SW,PK | 870-010-0010 |
| C135 | CAP, TA,10UF, 293D106X0004A2T4V | 102-003-0106 | Q3 | TRANS,BRT,PNP,KRA110SPK,SOT-23,SW,PK | 870-010-0010 |
| C136 | CAP, TA, 100UF, 20%, 6.3V, D | 102-013-3107 | Q4 | TRANS,BRT,PNP,KRA110SPK,SOT-23,SW,PK | 870-010-0010 |
| C137 | CAP, CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | Q5 | TRANS,KRA104S,SOT-23 | 870-010-0005 |
| C145 | CAP, CER,470PF,10%,50V,X7R,0603 | 100-621-1471 | Q6 | TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL) | 870-200-0006 |
| C146 | CAP, CER,220PF,5%,50V,COG,0603 | 100-520-1221 | Q7 | TRANS,PNP,KTA1504(Y),SOT-23,SW | 870-100-0004 |
| C901 | CAP, CER, 0.01UF,5%,50V,X7R,0603 | 100-521-1103 | Q8 | TRANS,PNP,KTA1504(Y),SOT-23,SW | 870-100-0004 |
| C902 | CAP, CER, 0.01UF,5%,50V,X7R,0603 | 100-521-1103 | Q11 | TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL) | 870-200-0006 |
| C903 | CAP, CER, 0.01UF,5%,50V,X7R,0603 | 100-521-1103 | Q12 | TRANS,NPN,BFR92A,SOT-23,RFAMP,(P2P) | 870-200-0020 |
| C904 | CAP, CER, 0.01UF,5%,50V,X7R,0603 | 100-521-1103 | Q13 | TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL) | 870-200-0006 |
| C905 | CAP, CER,18PF,5%,50V,COG,0603 | 100-520-1180 | Q14 | TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL) | 870-200-0006 |
| C906 | CAP, CER,18PF,5%,50V,COG,0603 | 100-520-1180 | Q16 | TRANS,NPN,BFR92A,SOT-23,RFAMP,(P2P) | 870-200-0020 |
| C907 | CAP, CER,0.1UF,+80-20%,25V,Y5V,0603 | 100-813-1104 | Q17 | TRANS,900MHZ AMP,MMBR951,SOT-23 | 870-200-0026 |
| C908 | CAP, CER,33PF,5%,50V,COG,0603 | 100-520-1330 | Q18 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| C910 | CAP, CER, 0.01UF,5%,50V,X7R,0603 | 100-521-1103 | Q19 | TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL) | 870-200-0006 |
| C911 | CAP, CER, 0.01UF,5%,50V,X7R,0603 | 100-521-1103 | Q21 | TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL) | 870-200-0006 |
| CF1 | FILTER, CER,CFW455F,455KHZ | 310-010-0010 | Q22 | TRANS,PNP,KTA1663(Y),SOT-89,HC/SW,(HY) | 870-150-0002 |
| CF2 | FILTER, CER,CFW455HT,455KHZ | 310-101-0009 | Q23 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| D1 | DIODE,SW,KDS181S,SOT-23 | 220-010-0004 | Q24 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| D5 | DIODE,PIN,UPP9401,NEEDPKG SIZE | 220-020-0001 | Q25 | TRANS,NPN,BFR92A,SOT-23,RFAMP,(P2P) | 870-200-0020 |
| D6 | DIODE,PIN,UPP9401,NEEDPKG SIZE | 220-020-0001 | Q26 | TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL) | 870-200-0006 |
| D8 | DIODE,SW,KDS193,SOT-23 | 220-010-0003 | Q27 | TRANS,NPN,KTC3875(BL),SOT-23,SW,(ALL) | 870-200-0006 |
| D9 | DIODE,SCHOTTKY,CHIP,HSMS-2817#L31 | 220-040-0009 | Q28 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| D11 | DIODE,SW,KDS193,SOT-23 | 220-010-0003 | Q31 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| D12 | DIODE,SW,KDS193,SOT-23 | 220-010-0003 | Q32 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| D13 | DIODE,SW,KDS181S,SOT-23 | 220-010-0004 | Q33 | TRANS,PNP,KTA1504(Y),SOT-23,SW | 870-100-0004 |
| D14 | DIODE,SW,KDS181S,SOT-23 | 220-010-0004 | Q34 | TRANS,BRT,NPN,KRC104S,SOT-23,SW,ND | 870-020-0001 |
| D15 | DIODE, CHIP,SM4004,400V,1A,SMD | 220-030-0003 | Q901 | TRANS,NPN,KTC4075,UMT3 | 870-200-0031 |
| D17 | DIODE,SCHOTTKY,CHIP,PRLL5817,SOD87 | 220-040-0008 | Q902 | TRANS,KTA2014,MAX-900K | 870-100-0018 |
| D18 | DIODE,KDS160 | 220-010-0017 | Q903 | TRANS,NPN,KTC4075,UMT3 | 870-200-0031 |
| D20 | DIODE,KDS160 | 220-010-0017 | Q904 | TRANS,NPN,KTC4075,UMT3 | 870-200-0031 |
| D901 | DIODE,SW,KDS226,SOT-23 | 220-010-0005 | Q905 | TRANS,NPN,KTC4075,UMT3 | 870-200-0031 |
| D902 | DIODE,SW,KDS226,SOT-23 | 220-010-0005 | R1 | RES,TF,10K,5%,1/16W,+/-200,0603 | 741-102-1103 |
| IC1 | IC,VREG,TK11450M,+5V,SOT-23L,(R5) | 441-010-0002 | R2 | RES,TF,100K,5%,1/16W,+/-200,0603 | 741-102-1104 |
| IC2 | IC,PLL,MC145191FR2,SO-20,RS-440 | 440-050-0011 | R3 | RES,TF,2.2K,5%,1/16W,TC250,0603 | 741-102-1222 |
| IC5 | IC,VHFRVCVR,MC3371D,SO-16,NWRBAND | 441-060-0007 | R4 | RES,1.8K,1/16W,5%,T 1608 | 741-102-1182 |
| L1 | COIL,CHIP,18NH,20%,LL2012-F18NM | 371-010-5180 | R5 | RES,1.8K,1/16W,5%,T 1608 | 741-102-1182 |
| L2 | COIL,CHIP,18NH,20%,LL2012-F18NM | 371-010-5180 | R6 | RES,TF,2K, 1/16W,5%,T 1608 | 741-102-1202 |
| L3 | COIL,0.1UH:NL252018T-R10J | 371-804-3R10 | R7 | RES,1.8K,1/16W,5%,T 1608 | 741-102-1182 |
| L4 | COIL,CHIP,18NH,20%,LL2012-F18NM | 371-010-5180 | R8 | RES,910,1/10W,5%,T 2012 | 741-117-2911 |
| L5 | COIL,CHIP,18NH,20%,LL2012-F18NM | 371-010-5180 | R11 | RES,TF,100,5%,1/16W,TC250,0603 | 741-107-1101 |
| L6 | COILCHIP,0.82UH:NL252018T-R82J | 371-804-3R82 | R12 | RES,5.6K,1/16W,5%,T 1608 | 741-102-1562 |
| L7 | COILSPRING, 2X0.75X3T:LSMD | 350-000-0103 | R13 | RES,TF,2.7K,5%,1/16W,+/-200,0603 | 741-102-1272 |
| L8 | COILSPRING, 2X0.75X3T:LSMD | 350-000-0103 | R14 | RES,TF,2.7K,5%,1/16W,+/-200,0603 | 741-102-1272 |
| L11 | COILSPRING, 2X0.75X3T:LSMD | 350-000-0103 | R15 | RES,TF,100,5%,1/16W,TC250,0603 | 741-107-1101 |
| L12 | COIL,1.2UH:NL252018T-1R2J | 371-004-31R2 | R16 | RES,910,1/10W,5%,T 2012 | 741-117-2911 |
| L13 | COILSPRING, 2X0.75X3T:LSMD | 350-000-0103 | R17 | RES,TF,12K,5%,1/16W,+/-200,0603 | 741-102-1123 |
| L14 | COILCHIP,0.47UH:NL252018T-R47J | 371-804-3R47 | R18 | RES,TF,10K,5%,1/16W,+/-200,0603 | 741-102-1103 |
| | | | R21 | RES,33,1/16W5%T 1608 | 741-102-1330 |
| | | | R22 | RES,TF,4.7K,5%,1/16W,TC250,0603 | 741-107-1472 |
| | | | R23 | RES,TF,100,5%,1/16W,TC250,0603 | 741-107-1101 |
| | | | R24 | RES,5.6K,1/16W,5%,T 1608 | 741-102-1562 |

MAXON

SP-300 HAND HELD

| REF # | DESCRIPTION | PART # | REF # | DESCRIPTION | PART # |
|-------|----------------------------------|--------------|--------|-------------------------------------|--------------|
| R25 | RES,TF,4.7K,5%,1/16W,TC250,0603 | 741-107-1472 | R93 | RES,TF,100,5%,1/16W,TC250,0603 | 741-107-1101 |
| R26 | RES,TF,18,1/16W,5%,T 1608 | 741-102-1180 | R94 | RES,TF,1K,5%,1/16W,+/-200,0603 | 741-102-1102 |
| R27 | RES,TF,4.7K,5%,1/16W,TC250,0603 | 741-107-1472 | R95 | RES,TF,82K,5%,1/16W,TC250,0603 | 741-107-1823 |
| R28 | RES,TF,220,1/16W,5%,T 1608 | 741-102-1221 | R96 | RES,TF,39K,5%,1/16W,TC250,0603 | 741-107-1393 |
| R31 | RES,TF,300,1/16W,5%,T 1608 | 741-102-1301 | R97 | RES,TF,10,5%,1/16W,+/-200,0603 | 741-102-1100 |
| R32 | RES,TF,300,1/16W,5%,T 1608 | 741-102-1301 | R98 | RES,TF,10K,5%,1/16W,+/-200,0603 | 741-102-1103 |
| R33 | RES,TF,6.8K,5%,1/16W,+/-200,0603 | 741-102-1682 | R99 | RES,100K 1/16W1%T 1608 | 740-211-1003 |
| R34 | RES,TF,18,1/16W,5%,T 1608 | 741-102-1180 | R102 | RES,TF,22K,5%,1/16W,TC250,0603 | 741-107-1223 |
| R35 | RES,5.6K,1/16W,5%,T 1608 | 741-102-1562 | R103 | RES,TF,10K,5%,1/16W,+/-200,0603 | 741-102-1103 |
| R37 | RES,1.2K 1/16W5%T1608 | 741-102-1122 | R104 | RES,TF,10K,5%,1/16W,+/-200,0603 | 741-102-1103 |
| R41 | RES,TF,22,1/16W,5%,T 1608 | 741-102-1220 | R105 | RES,TF,22K,5%,1/16W,TC250,0603 | 741-107-1223 |
| R42 | RES,TF,12K,5%,1/16W,+/-200,0603 | 741-102-1123 | R106 | RES,TF,22K,5%,1/16W,TC250,0603 | 741-107-1223 |
| R43 | RES,TF,10K,5%,1/16W,+/-200,0603 | 741-102-1103 | R108 | RES,TF,56K,1/16W,5%,T 1608,0603 | 741-102-1563 |
| R45 | RES,TF,22K,5%,1/16W,TC250,0603 | 741-107-1223 | R109 | RES,0.1 1W1% 1218 | 740-521-0R10 |
| R47 | RES,TF,2.2,5%,1/10W,TC250,0805 | 741-117-2229 | R110 | RES,270 1/16W5%T 1608 | 741-102-1271 |
| R48 | RES,TF,2.2,5%,1/10W,TC250,0805 | 741-117-2229 | R111 | RES,TF,10K,5%,1/16W,+/-200,0603 | 741-102-1103 |
| R50 | RES,TF,1M,5%,1/16W,+/-200,0603 | 741-102-1105 | R112 | RES,TF,22K,5%,1/16W,TC250,0603 | 741-107-1223 |
| R51 | RES,TF,2.2,5%,1/10W,TC250,0805 | 741-117-2229 | R113 | RES,TF,470K,5%,1/16W,TC250,0603 | 741-107-1474 |
| R52 | RES,TF,3.3K,5%,1/16W,TC250,0603 | 741-107-1332 | R114 | RES,TF,100K,5%,1/16W,+/-200,0603 | 741-102-1104 |
| R53 | RES,TF,10K,5%,1/16W,+/-200,0603 | 741-102-1103 | R115 | RES,TF,47,5%,1/16W,50V,T1608,0603 | 741-102-1470 |
| R54 | RES,TF,1K,5%,1/16W,+/-200,0603 | 741-102-1102 | R116 | RES,TF,22K,5%,1/16W,TC250,0603 | 741-107-1223 |
| R55 | RES,1.2K 1/16W5%T1608 | 741-102-1122 | R117 | RES,TF,22K,5%,1/16W,TC250,0603 | 741-107-1223 |
| R56 | RES,270 1/16W5%T 1608 | 741-102-1271 | R121 | RES,TF,220K,5%,1/16W,TC250,0603 | 741-107-1224 |
| R57 | RES,100K 1/16W1%T 1608 | 740-211-1003 | R122 | RES,TF,4.7K,5%,1/16W,TC250,0603 | 741-107-1472 |
| R58 | RES,TF,470K,5%,1/16W,TC250,0603 | 741-107-1474 | R125 | RES,TF,22,1/16W,5%,T 1608 | 741-102-1220 |
| R59 | RES,TF,39,5%,50V,0603 | 741-102-1390 | R126 | RES,TF,10K,5%,1/16W,+/-200,0603 | 741-102-1103 |
| R61 | RES,68K 1/16W1%T1608 | 740-211-1683 | R128 | RES,TF,10K,5%,1/16W,+/-200,0603 | 741-102-1103 |
| R62 | RES,68K 1/16W1%T1608 | 740-211-1683 | R130 | RES,TF,100,5%,1/16W,TC250,0603 | 741-107-1101 |
| R63 | RES,150,1/16W,5%,T 1608 | 741-102-1151 | R132 | RES,5.6K,1/16W,5%,T 1608 | 741-102-1562 |
| R64 | RES,TF,22,1/16W,5%,T 1608 | 741-102-1220 | R901 | RES,TF,2.2K,5%,1/16W,TC250,0603 | 741-102-1222 |
| R65 | RES,51,1/16W,5%,T 1608 | 741-102-1510 | R902 | RES,TF,2.2K,5%,1/16W,TC250,0603 | 741-102-1222 |
| R66 | RES,TF,100,5%,1/16W,TC250,0603 | 741-107-1101 | R903 | RES,TF,4.7K,5%,1/16W,TC250,0603 | 741-107-1472 |
| R67 | RES,TF,22K,5%,1/16W,TC250,0603 | 741-107-1223 | R904 | RES,TF,7.5K,5%,1/16W,50V,T1608,0603 | 741-102-1752 |
| R68 | RES,TF,22K,5%,1/16W,TC250,0603 | 741-107-1223 | R905 | RES,TF,27K,5%,1/16W,TC250,0603 | 741-107-1273 |
| R69 | RES,TF,470K,5%,1/16W,TC250,0603 | 741-107-1474 | R906 | RES,TF,7.5K,5%,1/16W,50V,T1608,0603 | 741-102-1752 |
| R70 | RES,TF,470K,5%,1/16W,TC250,0603 | 741-107-1474 | R907 | RES,TF,27K,5%,1/16W,TC250,0603 | 741-107-1273 |
| R71 | RES,TF,1K,5%,1/16W,+/-200,0603 | 741-102-1102 | R908 | RES,TF,10,5%,1/16W,+/-200,0603 | 741-102-1100 |
| R72 | RES,TF,220K,5%,1/16W,TC250,0603 | 741-107-1224 | R909 | RES,TF,470,5%,1/16W,TC250,0603 | 741-107-1471 |
| R74 | RES,TF,22K,5%,1/10W,TC250,0805 | 741-117-2223 | RLK2 | RES,TF,0.5%,1/16W,TC250,0603 | 741-107-1000 |
| R75 | RES,TF,47K,5%,1/16W,TC250,0603 | 741-107-1473 | RLK3 | RES,TF,0.5%,1/16W,TC250,0603 | 741-107-1000 |
| R76 | RES,TF,22K,5%,1/16W,TC250,0603 | 741-107-1223 | RLK4 | RES,TF,0.5%,1/16W,TC250,0603 | 741-107-1000 |
| R77 | RES,TF,22K,5%,1/16W,TC250,0603 | 741-107-1223 | RLK5 | RES,TF,0.5%,1/16W,TC250,0603 | 741-107-1000 |
| R78 | RES,TF,2.7K,5%,1/16W,+/-200,0603 | 741-102-1272 | RLK7 | RES,TF,0.5%,1/16W,TC250,0603 | 741-107-1000 |
| R79 | RES,TF,10,5%,1/16W,+/-200,0603 | 741-102-1100 | RLK12 | RES,TF,0.5%,1/16W,TC250,0603 | 741-107-1000 |
| R81 | RES,TF,2.7K,5%,1/16W,+/-200,0603 | 741-102-1272 | RLK16 | RES,TF,0.5%,1/16W,TC250,0603 | 741-107-1000 |
| R82 | RES,TF,10K,5%,1/16W,+/-200,0603 | 741-102-1103 | RLK36 | RES,TF,0.5%,1/16W,TC250,0603 | 741-107-1000 |
| R83 | RES,TF,18K,1/16W5%T 1608 | 741-102-1183 | RLK49 | RES,TF,0.5%,1/16W,TC250,0603 | 741-107-1000 |
| R84 | RES,TF,18K,1/16W5%T 1608 | 741-102-1183 | RLK123 | RES,TF,0.5%,1/16W,TC250,0603 | 741-107-1000 |
| R85 | RES,TF,39K,5%,1/16W,TC250,0603 | 741-107-1393 | RLK488 | RES,TF,0.5%,1/16W,TC250,0603 | 741-107-1000 |
| R86 | RES,TF,1K,5%,1/16W,+/-200,0603 | 741-102-1102 | RV1 | RES,SEMIFIXED,10KB RH0651C100103 | 901-002-0103 |
| R87 | RES,TF,330K,5%,1/16W,+/-200,0603 | 741-102-1334 | RV2 | POT,ROTARY, 1K, 3DIAMM,SMD | 901-001-0102 |
| R88 | RES,TF,100,5%,1/16W,TC250,0603 | 741-107-1101 | RV3 | RES,SEMIFIXED,10KB RH0651C100103 | 901-002-0103 |
| R89 | RES,TF,22,1/16W,5%,T 1608 | 741-102-1220 | RV4 | POT,ROTARY, 1K, 3DIAMM,SMD | 901-001-0102 |
| R91 | RES,TF,470,5%,1/16W,TC250,0603 | 741-107-1471 | RV5 | RES,SEMIFIXED,10KB RH0651C100103 | 901-002-0103 |
| R92 | RES,TF,2.7K,5%,1/16W,+/-200,0603 | 741-102-1272 | T1 | COIL,IFT,SMD,455KHZQUAD | 353-012-0001 |
| | | | T2 | TRANSFORMERSCHIP 617PT-1019 | 840-010-0002 |
| | | | T3 | TRANSFORMERSCHIP 617PT-1019 | 840-010-0002 |

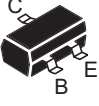
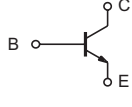
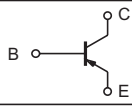
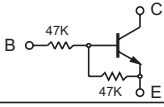
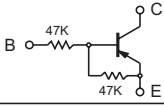
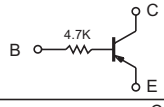
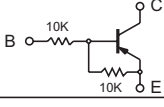
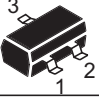
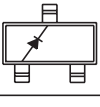
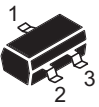
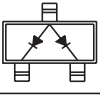
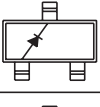
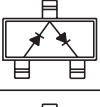
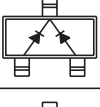
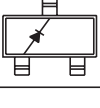
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SP-300 HAND HELD


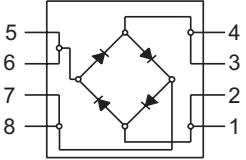

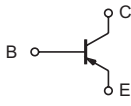
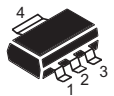
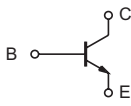
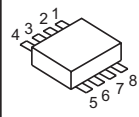





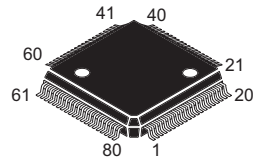
| REF# | DESCRIPTION | PART# |
|-------------|---|--------------|
| TCXO | TCXO, KXN1343A, 12.8M, 2.0PPM | 150-000-0003 |
| TH1 | THERM, 33K, NTCCS32163SH333KC | 700-050-0002 |
| U3 | IC, OP AMP, LM358M, SO-8, DUAL OP AMP | 441-030-0006 |
| U6 | IC, AUDIO AMP, LM386M-1, 0.33W, SO-8 | 441-040-0002 |
| U8 | IC, OP AMP, LM358M, SO-8, DUAL OP AMP | 441-030-0006 |
| VR3 | POT, 20K, RK0971111 20KA | 901-002-0203 |
| X1 | CRYSTAL, 44.645M -30 15PM, 32P, RX 3RD, HC-45 | 168-044-6450 |
| XF1 | FILTER, CRYSTAL, KFN1045AA(45.1M) (BMO-U) | 310-030-0015 |

MAXON

SP-300 HAND HELD

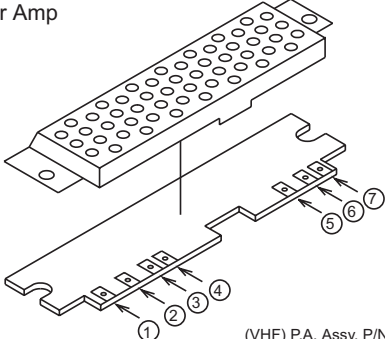
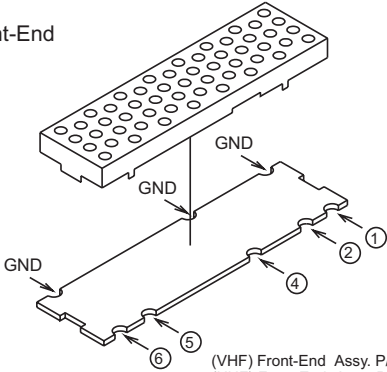
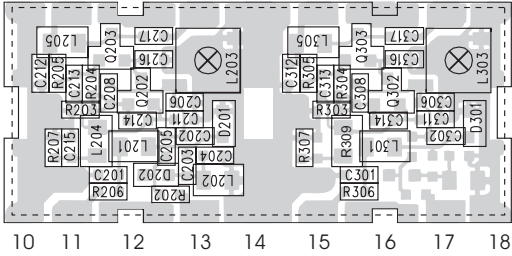
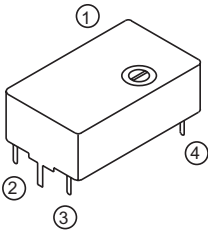
COMPONENT PINOUT

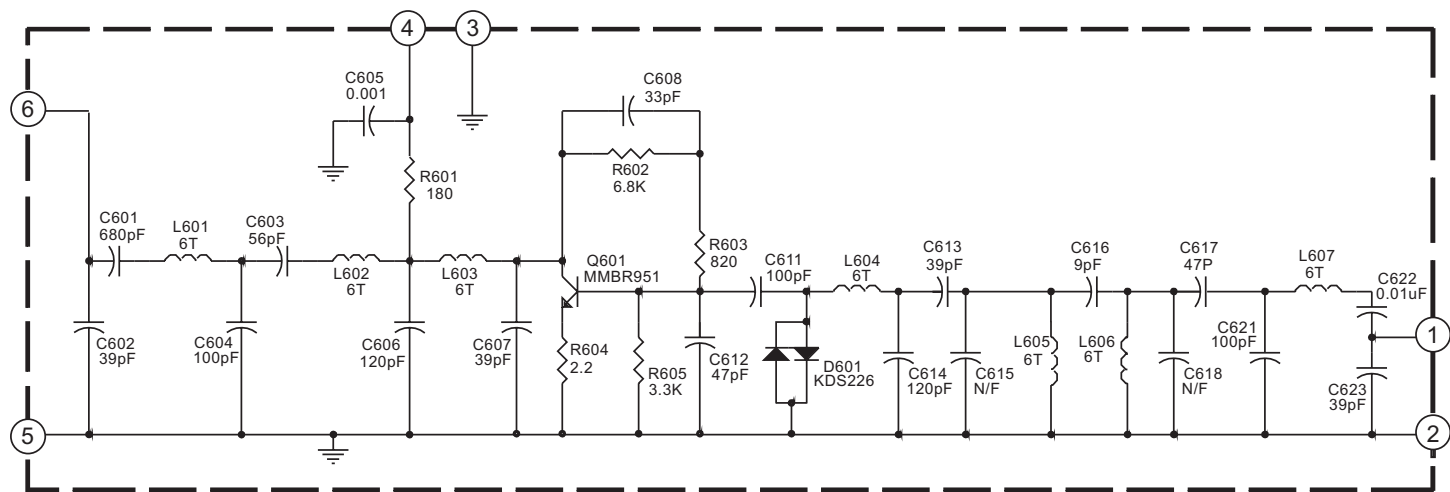
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|  | 2SC5084 | Q202,203,302,303,601 |  |
| | MMBR951 | Q16,17,501,601 | |
| | BFR92A | Q12,16,25 | |
| | KTC3875S (BL) | Q6,11,13,14,21,26,27 | |
| | KTA1504SY | Q7,8,33 |  |
| | KRC104S (ND) | Q18,23,24,28,31,32,34,403, Q404,405,411,413 |  |
| | KRA104S (PD) | Q5,410,412 |  |
| | KRA101S (PA) | Q406,407 | |
| | KRA110S (NK) | Q2,3,4,401,416 |  |
| | KRA102S (PB) | Q1 |  |
|  | MMBZ5232B | D405, 406, 407 |  |
|  | KDS181 (A3) | D1,13,14,401,402,501 |  |
| | KDS193 (F3) | D8,11,12,403 |  |
| | KDS226 (C3) | D601,901,902 |  |
| | KDS184 (B3) | D404 |  |
| | UPP9401 | D5,6 |  |

| BASE DIAGRAM | MANUFACTURER'S PART NUMBER | REFERENCE NO. | SCHEMATIC |
|--|----------------------------|---------------|---|
|  | ND433G | D9 |  |
|  <p>1.BASE 2.COLLECTOR 3.EMITTER</p> | KTA1663 | Q22 |  |
|  <p>1.EMITTER 2.BASE 3.EMITTER 4.COLLECTOR</p> | BLT50 | Q502 |  |
|  <p>1,4,5,8:EMITTER 2,3:BASE 6,7:COLLECTOR</p> | BLT52 | Q503 |  |
|  | 1SV229 | D201,202,301 |  |
|  | SM4004 | D15 |  |
|  | HD4074818 | IC409 | CPU IC |

MAXON

SP-300 HAND HELD

| BASE DIAGRAM | PIN DESCRIPTION |
|--|---|
| <div>RF Power Amp</div>  <div> (VHF) P.A. Assy. P/N: 650-230-0012 (UHF) P.A. Assy. P/N: 650-230-0013 </div> | <div>No Description</div> <div> <div>1</div> <div>Input</div> <div>2</div> <div>GND</div> <div>3</div> <div>Vcc (Pre Drive)</div> <div>4</div> <div>Vcc Control (Drive)</div> <div>5</div> <div>Vcc (Final)</div> <div>6</div> <div>Output</div> <div>7</div> <div>GND</div> </div> |
| <div>RX Front-End</div>  <div> (VHF) Front-End Assy. P/N: 650-110-0012 (UHF) Front-End Assy. P/N: 650-110-0013 </div> | <div> <div>1</div> <div>Input</div> <div>2</div> <div>GND</div> <div>4</div> <div>B+(4V)</div> <div>5</div> <div>GND</div> <div>6</div> <div>Output</div> </div> |
| <div>RX/TX VCO</div>  <div> (VHF) V.C.O. Assy. P/N: 650-030-0021 (UHF) V.C.O. Assy. P/N: 650-030-0020 </div> | <div> <div>1</div> <div>Gnd</div> <div>9</div> <div>Gnd</div> <div>17</div> <div>Gnd</div> <div>2</div> <div>RX Out</div> <div>10</div> <div>Gnd</div> <div>18</div> <div>Gnd</div> <div>3</div> <div>Gnd</div> <div>11</div> <div>Gnd</div> <div>4</div> <div>RX Vcc</div> <div>12</div> <div>Gnd</div> <div>5</div> <div>Gnd</div> <div>13</div> <div>TX Mod</div> <div>6</div> <div>TX Out</div> <div>14</div> <div>Gnd</div> <div>7</div> <div>Gnd</div> <div>15</div> <div>Tuning</div> <div>8</div> <div>TX Vcc</div> <div>16</div> <div>Gnd</div> </div> |
| <div>12.8 MHz TCXO</div>  <div> (VHF ONLY) TCXO Assy. P/N: 650-100-0002 </div> | <div> <div>1</div> <div>Modulation</div> <div>2</div> <div>GND</div> <div>3</div> <div>Out</div> <div>4</div> <div>Vcc (5V)</div> </div> |



Notes:

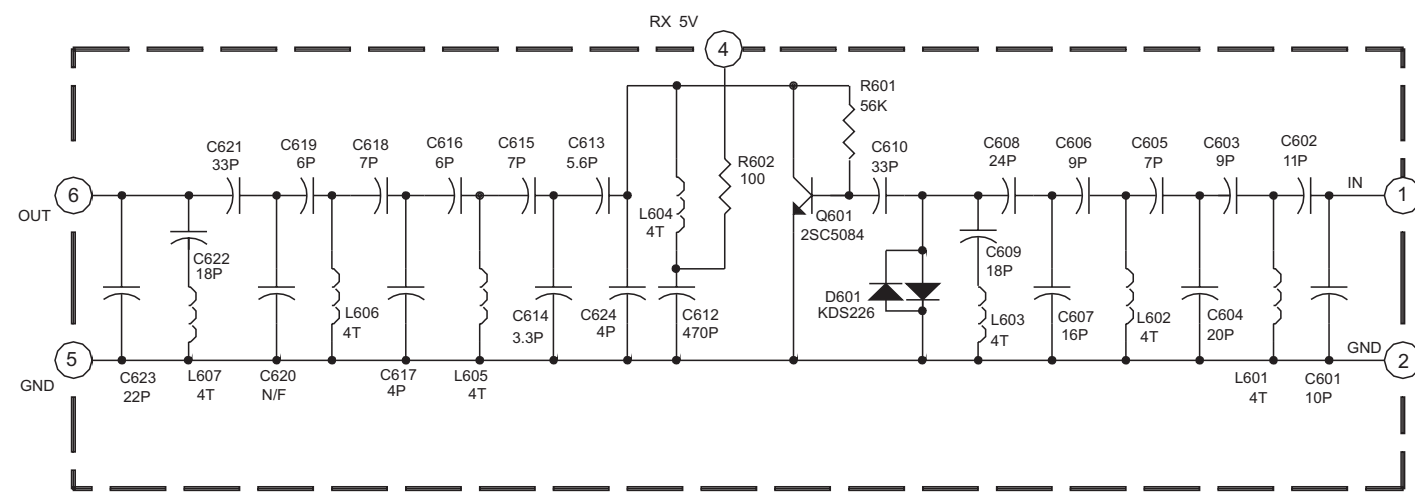
1. ALL VALUES ARE IN OHMS, MICROHENRIES OR MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE 1/10W 5% UNLESS OTHERWISE SPECIFIED.

VHF FRONT-END

(148-174MHz Band Shown)

Schematic P/N: 770-110-0012 Rev. C

PCB Assy. P/N: 650-110-0012 Rev C



Notes:

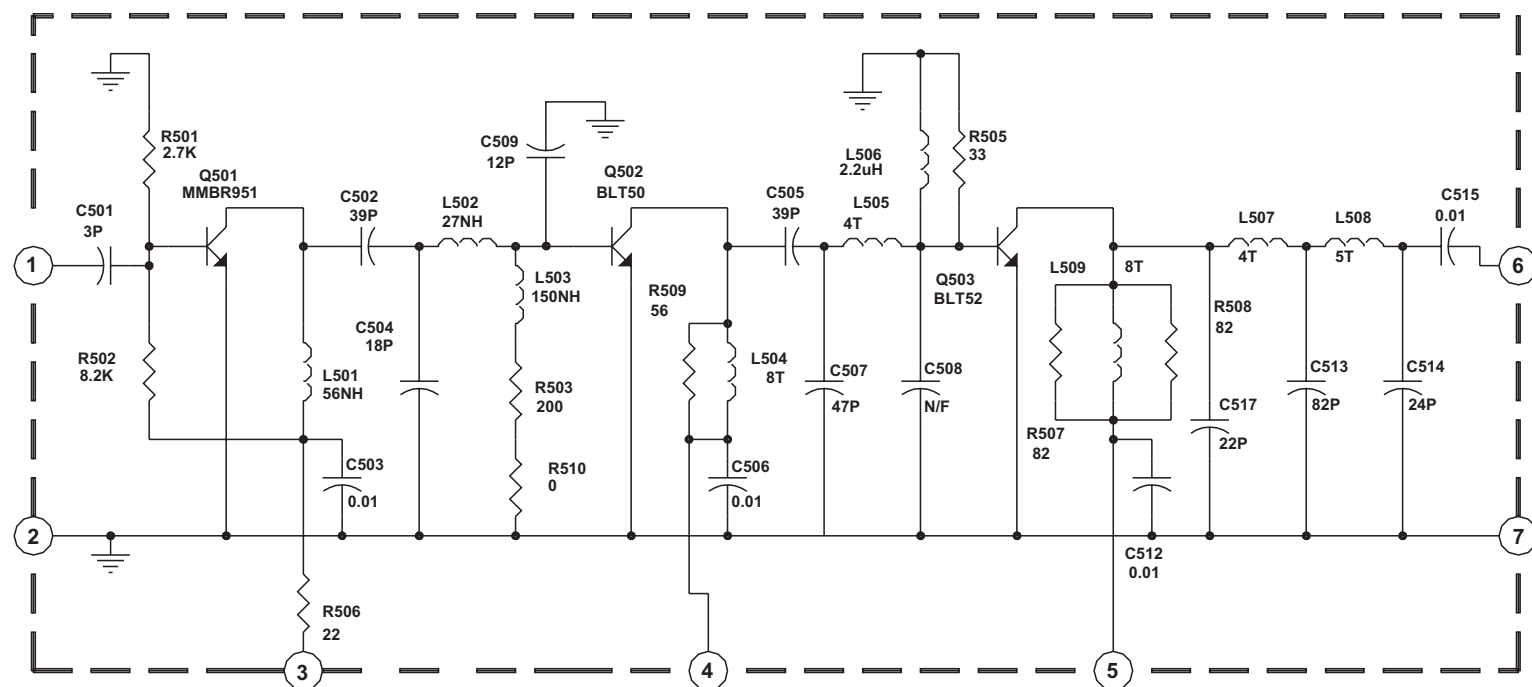
1. ALL VALUES ARE IN OHMS, MICROHENRIES OR MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE 1/10W 5% UNLESS OTHERWISE SPECIFIED.

UHF FRONT-END

(440-470MHz Band Shown)

Schematic P/N: 770-110-0013 Rev. D

PCB Assy. P/N: 650-110-0013 Rev. D



Notes:

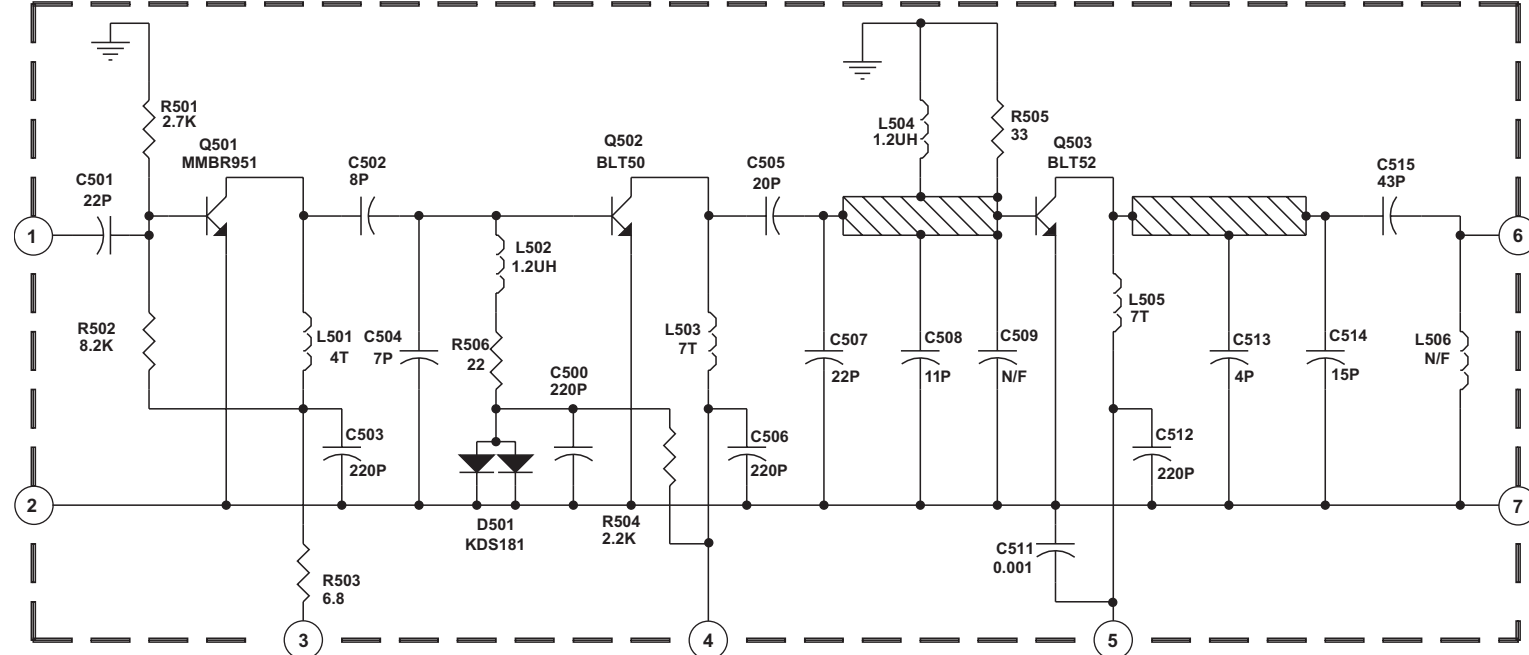
1. ALL VALUES ARE IN OHMS, MICROHENRIES OR MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE 1/10W 5% UNLESS OTHERWISE SPECIFIED.

VHF POWER AMP

(148-174MHz Band Shown)

Schematic P/N: 770-230-0012 Rev. A

PCB Assy. P/N: 650-230-0012 Rev. A



Notes:

1. ALL VALUES ARE IN OHMS, MICROHENRIES OR MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE 1/10W 5% UNLESS OTHERWISE SPECIFIED.

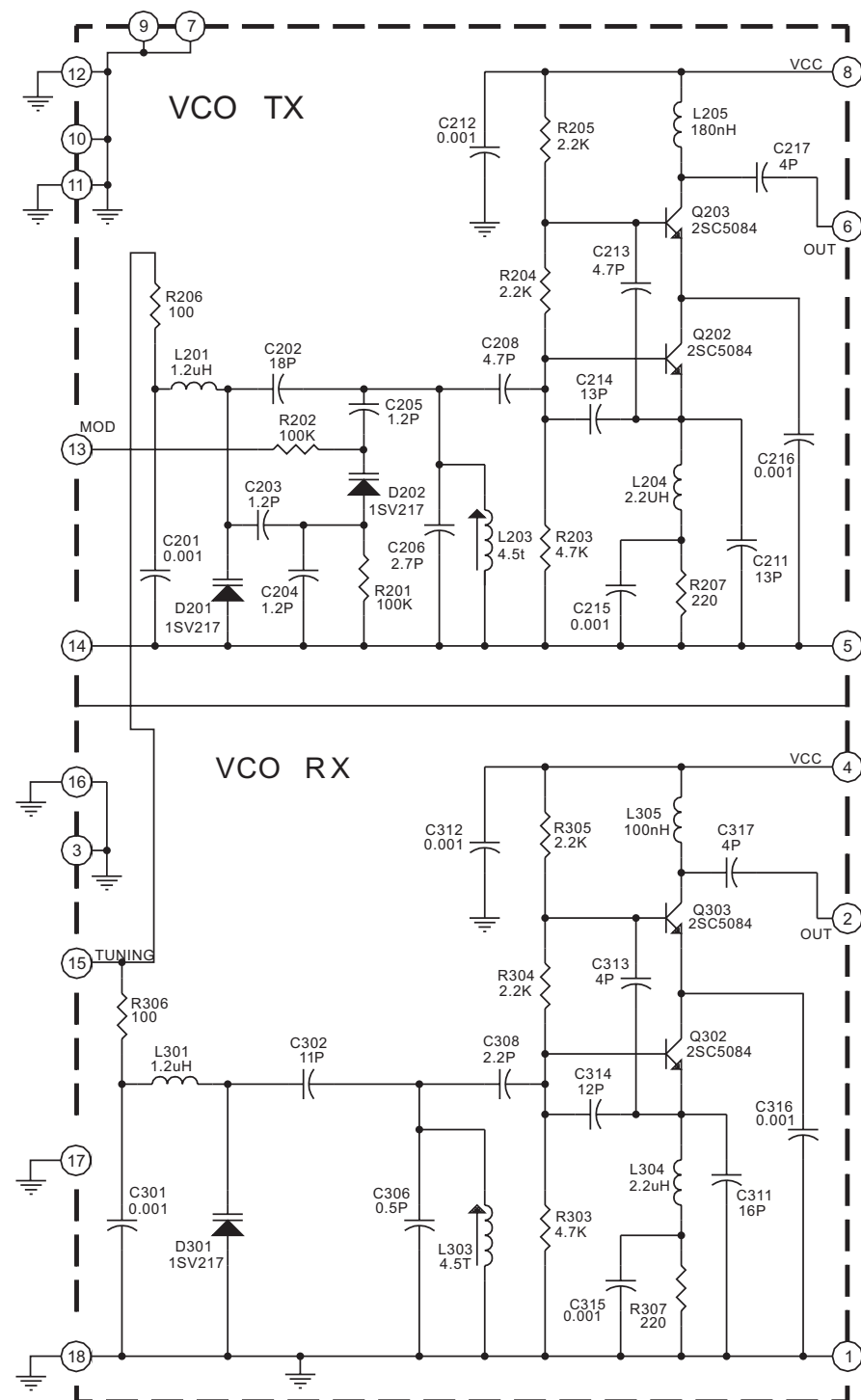
UHF POWER AMP

(440-470MHz Band Shown)

Schematic P/N: 770-230-0013 Rev. B

PCB Assy. P/N: 650-230-0013 Rev. B

●Note: Schematics are for reference only. Based on band selection, reference designators and part values may differ from schematics shown.



VHF V.C.O.

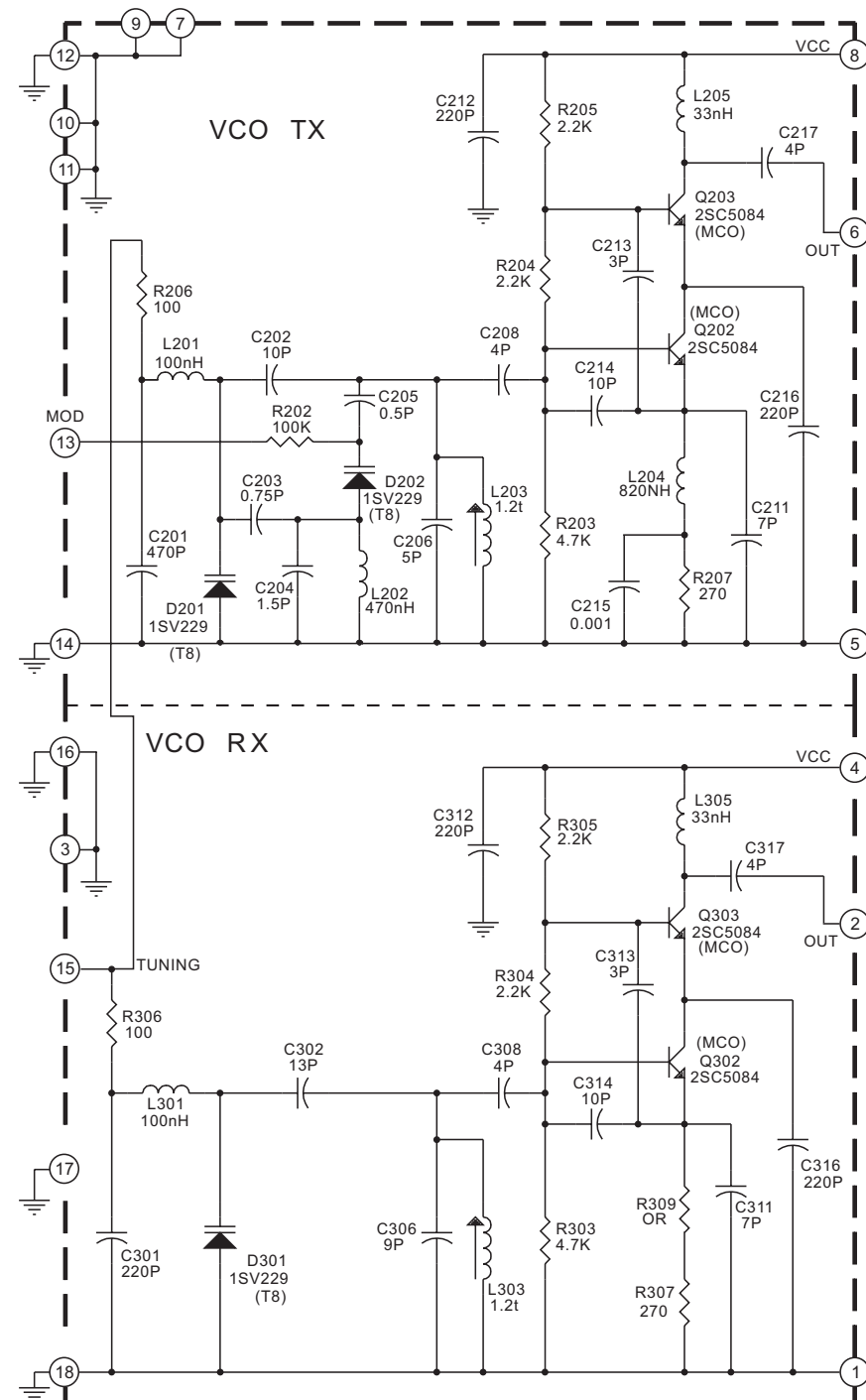
(148-174MHz Band Shown)

Schematic P/N: 770-030-0021 Rev. B

PCB Assy. P/N: 650-030-0021Rev. B

Notes:

1. ALL VALUES ARE IN OHMS, MICROHENRIES OR MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE 1/10W 5% UNLESS OTHERWISE SPECIFIED.

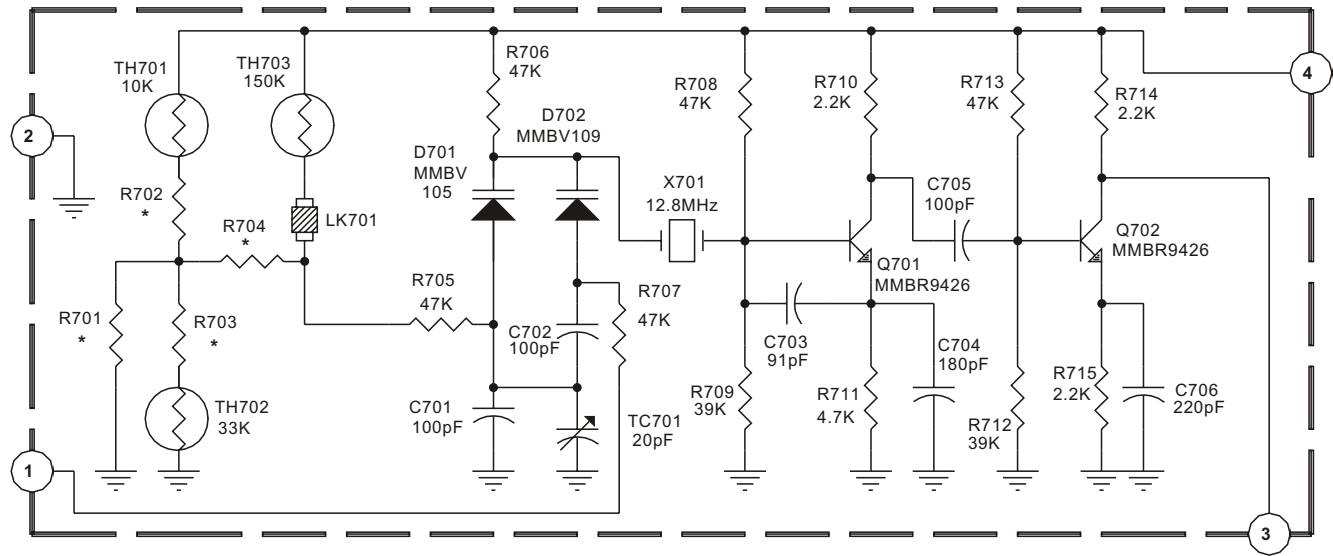


UHF V.C.O.

(440-470MHz Band Shown)

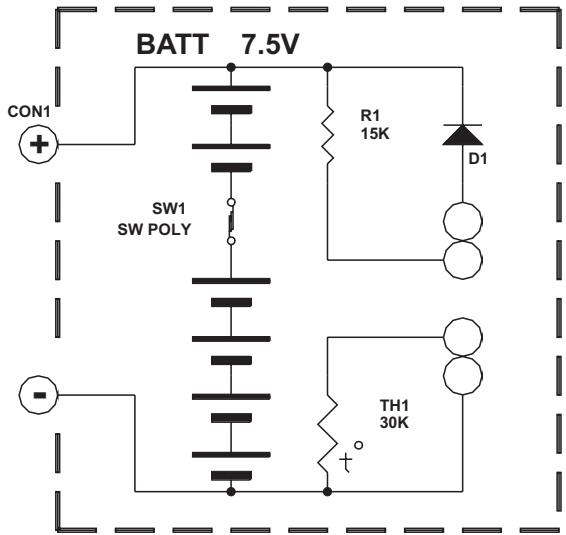
Schematic P/N: 770-030-0018 Rev. D

PCB Assy. P/N: 650-030-0020 Rev. A



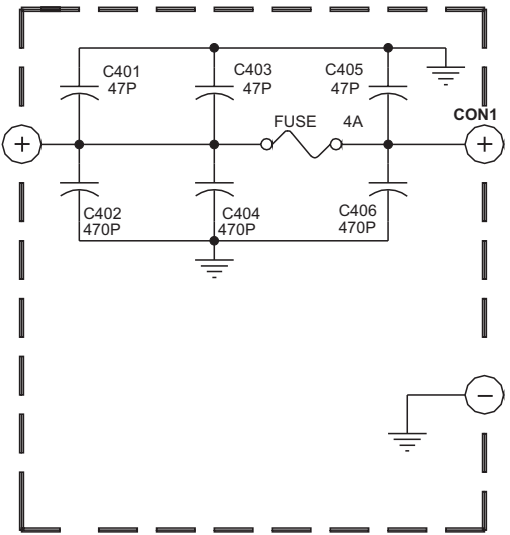
TCXO

Schematic P/N: 770-100-0002 Rev. D
PCB Assy. P/N: 650-100-0002 Rev. D



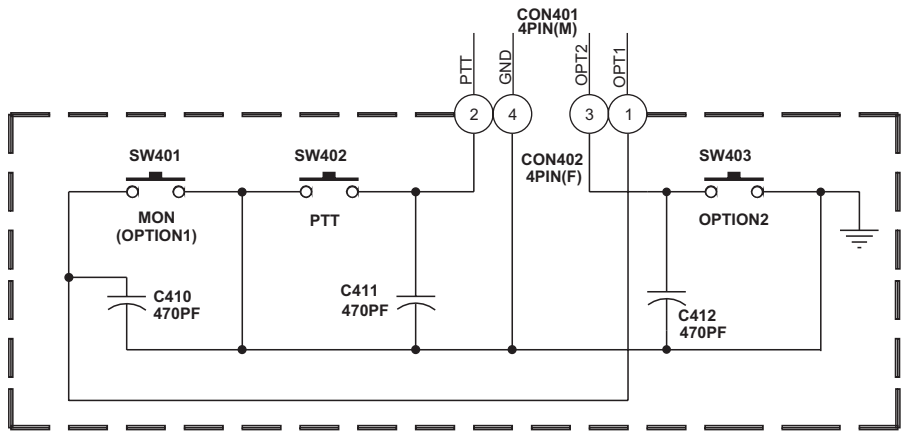
ACC-200 BATTERY

Schematic P/N: 770-210-0010
Shown for reference only



FUSE

Schematic P/N: 770-200-0004 Rev. B
PCB Assy. P/N: 650-200-0004 Rev. B

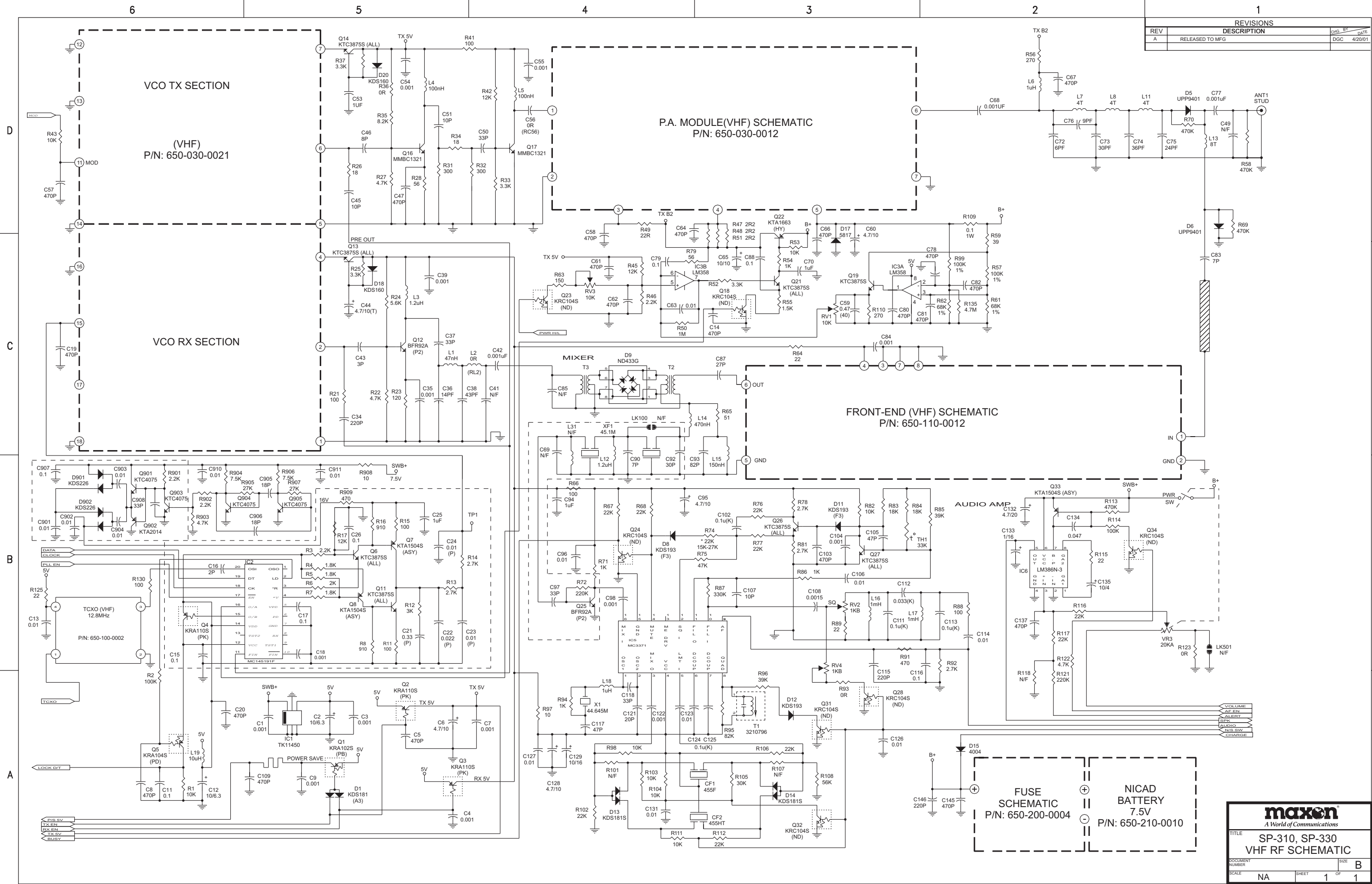


P.T.T.

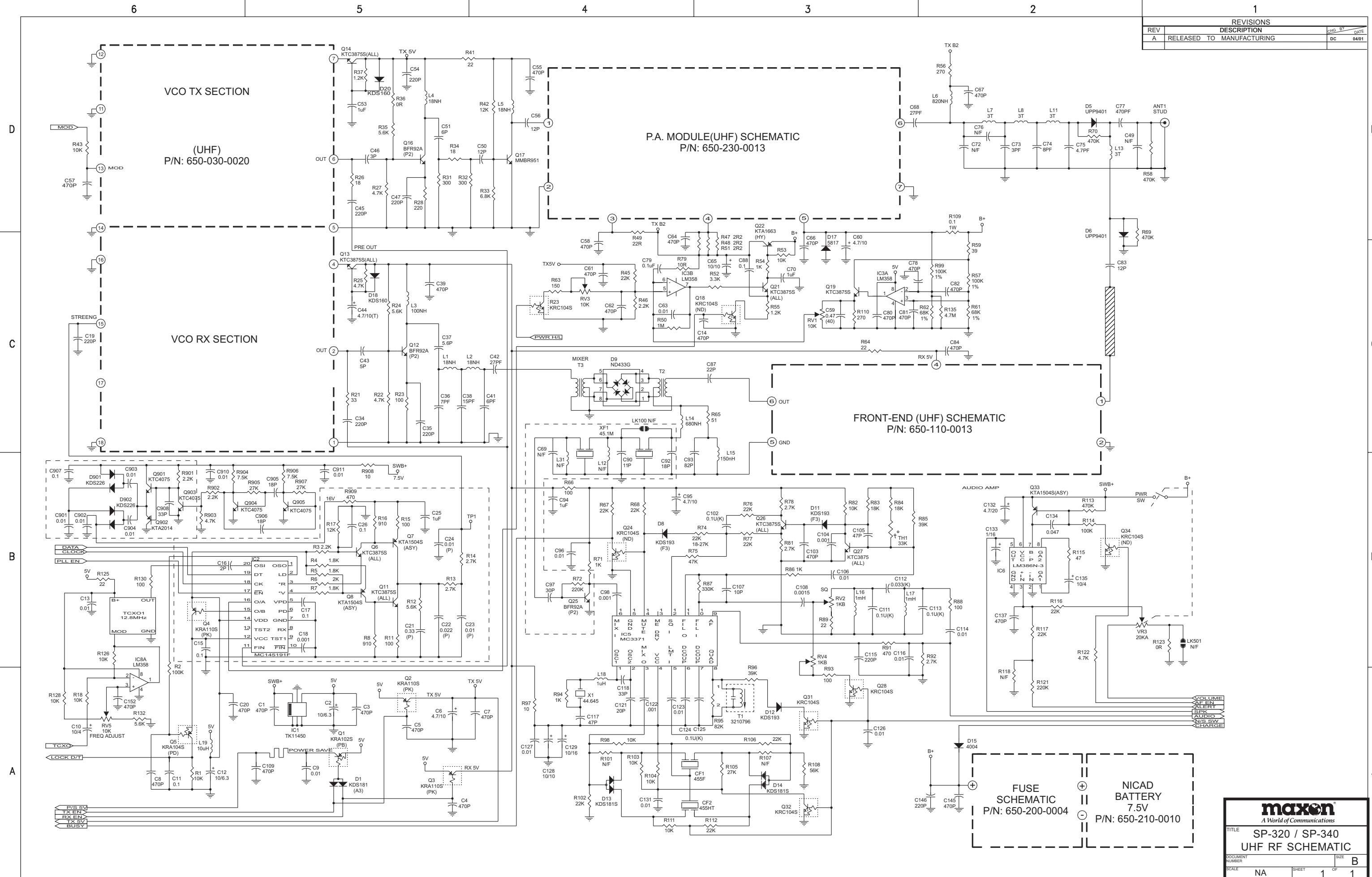
Schematic P/N: 770-180-0017 Rev. A
PCB Assy. P/N: 480-042-0028

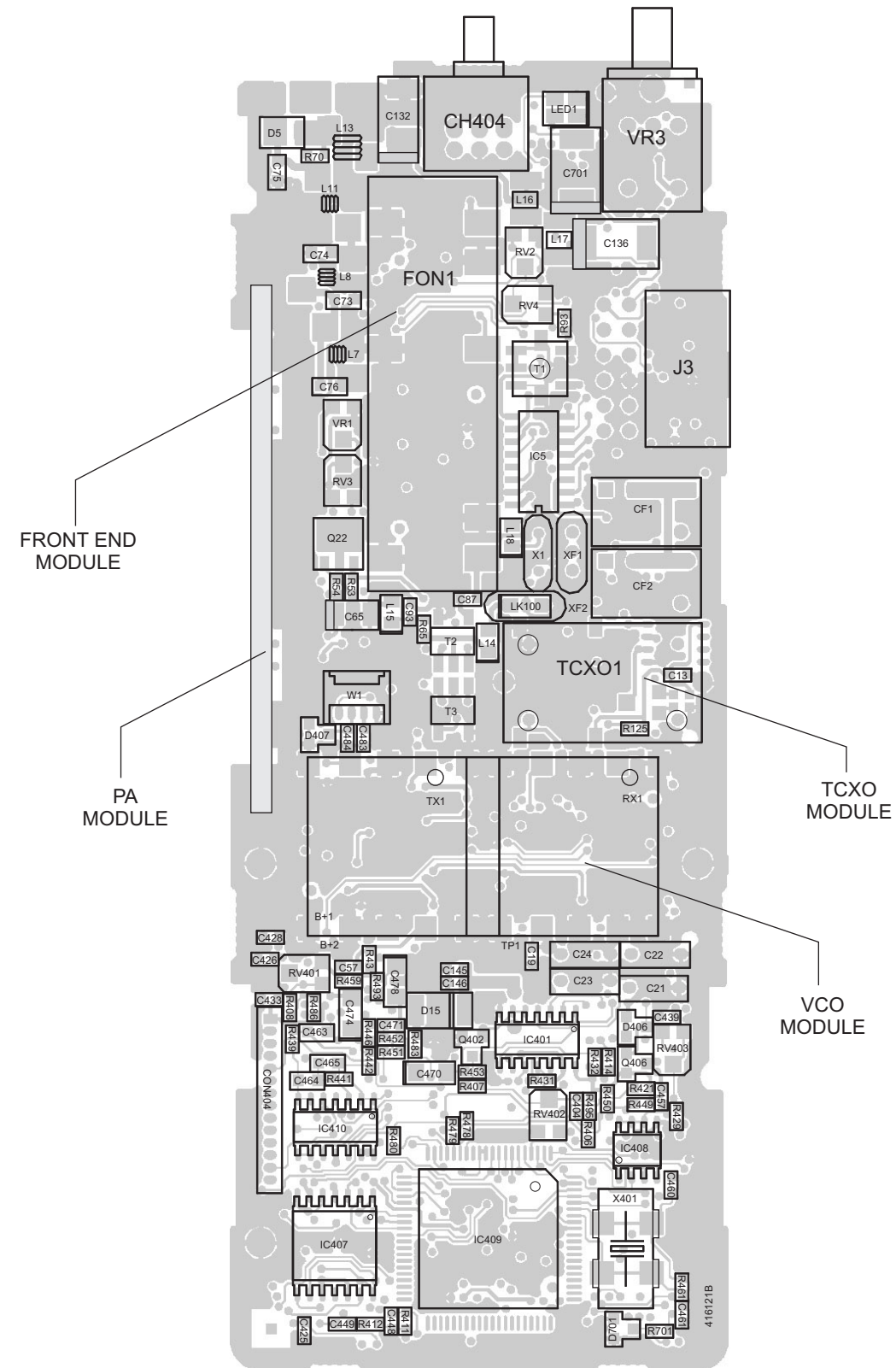
Notes:

1. ALL VALUES ARE IN OHMS, MICROHENRIES OR MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE 1/10W 5% UNLESS OTHERWISE SPECIFIED.

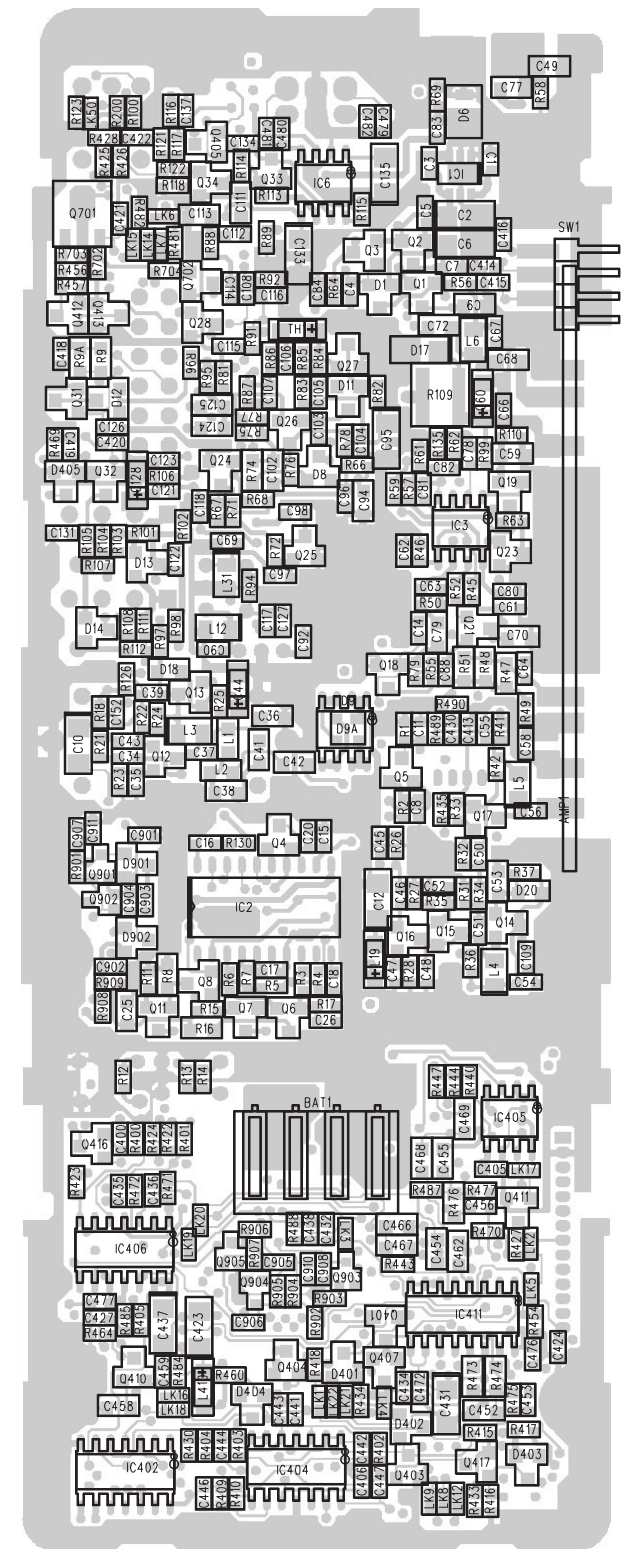


| REVISIONS | | | |
|-----------|---------------------------|--------|-------|
| REV | DESCRIPTION | CHG BY | DATE |
| A | RELEASED TO MANUFACTURING | DC | 04/01 |

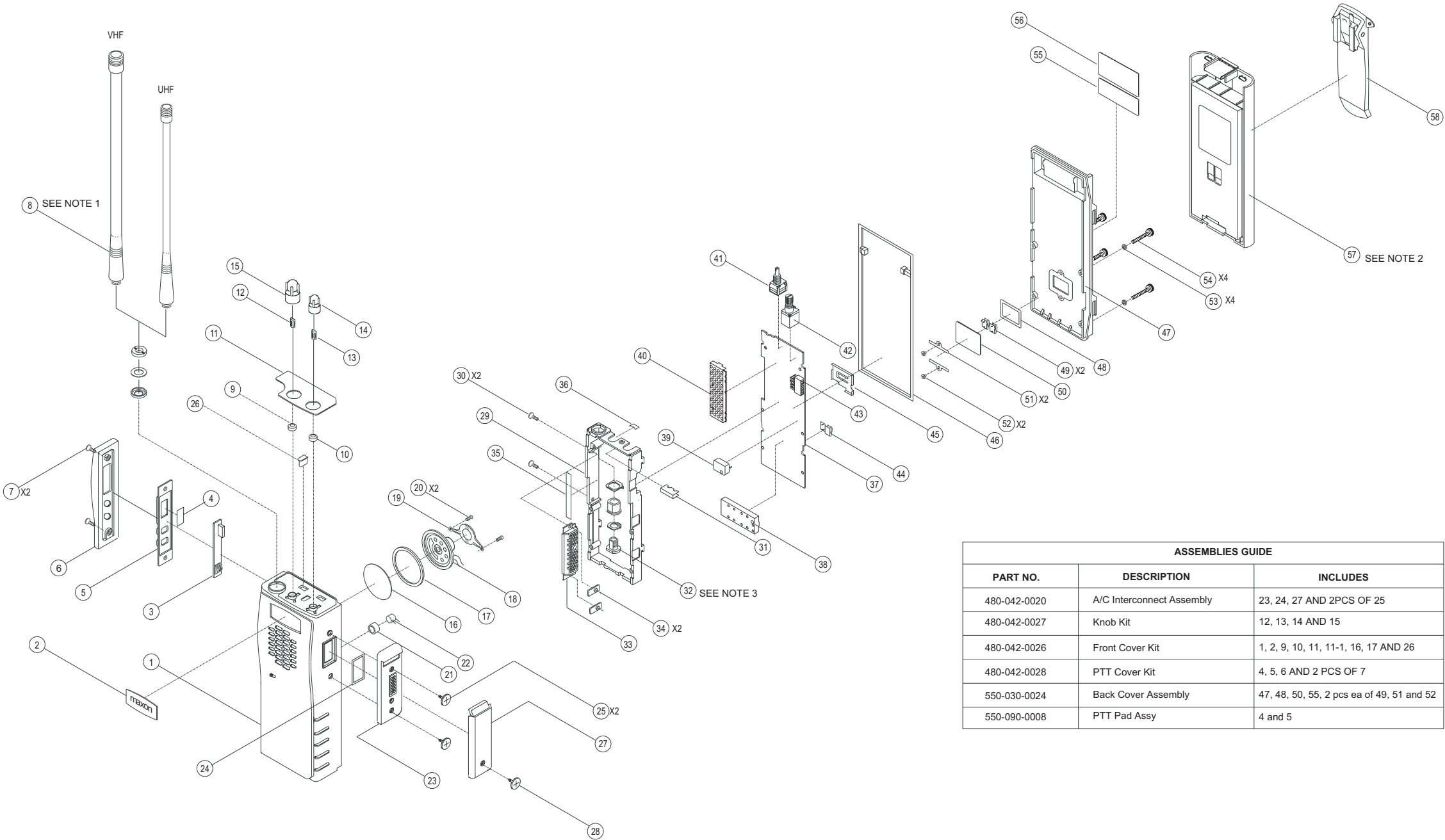




Board Layout (Top)
Main Board Assembly 416121B



Board Layout (Bottom)
Main Board Assembly 416121B



| ASSEMBLIES GUIDE | | |
|------------------|---------------------------|---|
| PART NO. | DESCRIPTION | INCLUDES |
| 480-042-0020 | A/C Interconnect Assembly | 23, 24, 27 AND 2PCS OF 25 |
| 480-042-0027 | Knob Kit | 12, 13, 14 AND 15 |
| 480-042-0026 | Front Cover Kit | 1, 2, 9, 10, 11, 11-1, 16, 17 AND 26 |
| 480-042-0028 | PTT Cover Kit | 4, 5, 6 AND 2 PCS OF 7 |
| 550-030-0024 | Back Cover Assembly | 47, 48, 50, 55, 2 pcs ea of 49, 51 and 52 |
| 550-090-0008 | PTT Pad Assy | 4 and 5 |

NOTES:

1. Contact Topaz3 Customer Service Department for antenna part numbers.
2. Refer to Maxon Price Guides for battery options.
3. Item 30 (Antenna Stud Kit) includes all hardware to mount antenna.

| NO. | Q'TY | PART NO. | PART NAME |
|------|------|----------------|--------------------------|
| 1 | 1 | 550-021-0025 | UPPER COVER ASS'Y |
| 2 | 1 | 490-070-0035 | NAME PLATE |
| 3 | 1 | 650-180-0021 | PTT ASSEMBLY |
| 4 | 1 | 560-130-0046 | PTT TENSION PLATE |
| 5 | 1 | 760-040-0027 | PTT PAD |
| 6 | 1 | 560-050-0058 | HOLDER PTT |
| 7 | 2 | 330-110-0134 | (+)MACHINE SCREW (PH) |
| 8 | 1 | SEE NOTE 1 | HELICAL ANT (VHF) |
| 8-1 | 1 | SEE NOTE 1 | WHIP ANT (UHF) |
| 9 | 1 | 330-220-0018 | CH GASKET |
| 10 | 1 | 330-220-0017 | VOL GASKET |
| 11 | 1 | 490-200-0054 | TOP OVERLAY (4 CHANNEL) |
| 11-1 | 1 | 490-200-0055 | TOP OVERLAY (16 CHANNEL) |
| 12 | 1 | 330-260-0004 | SPRING(CH) |
| 13 | 1 | 330-260-0005 | SPRING(VOL) |
| 14 | 1 | 660-090-0107 | KNOB VOL. |
| 15 | 1 | 660-090-0106 | KNOB CH. |
| 16 | 1 | 330-230-0051 | FELT |
| 17 | 1 | 330-220-0019 | GASKET |
| 18 | 1 | 050-010-0024 | SPEAKER |
| 19 | 1 | 560-090-0043 | BRACKET(SPK) |
| 20 | 2 | 330-111-0069 | (+)TAPPING SCREW (BH) |
| 21 | 1 | 330-160-0013 | BUSHING(MIC) |
| 22 | 1 | 050-020-0002 | MIC CONDENSER |
| 23 | 1 | 550-090-0010 | A/C HOUSING ASS'Y |
| 24 | 1 | 760-100-0003 | CONNECTOR SEAL |
| 25 | 2 | 330-110-0143 | (+)MACHINE SCREW (PH) |
| 26 | 1 | 660-160-0047 | LENS(LED) |
| 27 | 1 | 660-010-0175 | COVER A/C |
| 28 | 1 | 330-110-0146 | (+)MACHINE SCREW (FH) |
| 29 | 1 | 560-070-0011-C | CHASSIS |
| 30 | 2 | 330-110-0131 | (+)MACHINE SCREW (PH) |
| 31 | 1 | 906-723 | PROTECTION SHEET |
| 32 | 1 | 480-020-0017 | ANTENNA STUD KIT |
| 33 | 1 | 650-230-0012 | PA MODULE (VHF) |
| 33-1 | 1 | 650-230-0013 | PA MODULE (UHF) |
| 34 | 2 | 560-090-0012 | BRACKET |
| 35 | 1 | 390-025-0007 | INSULATION PLATE |
| 36 | 1 | 560-132-0001 | SPACER(CH SW MTG) |
| 37 | 1 | NOT AVAILABLE | P.C.B MAIN (SP-300) |
| 37-1 | 1 | NOT AVAILABLE | P.C.B MAIN (SP-310) |
| 37-2 | 1 | NOT AVAILABLE | P.C.B MAIN (SP-320) |
| 37-3 | 1 | NOT AVAILABLE | P.C.B MAIN (SP-330) |
| 38 | 1 | 650-030-0021 | VCO MODULE (VHF) |
| 38-1 | 1 | 650-030-0020 | VCO MODULE (UHF) |
| 39 | 1 | 650-100-0002 | TCXO MODULE |
| 40 | 1 | 650-110-0012 | FRONT END MODULE (VHF) |
| 40-1 | 1 | 650-110-0013 | FRONT END MODULE (UHF) |
| 41 | 1 | 830-010-0010 | ROTARY SW (4 CHANNEL) |
| 41-1 | 1 | 830-010-0011 | ROTARY SW (16 CHANNEL) |
| 42 | 1 | 902-001-0203 | VOLUME (ON/OFF) SWITCH |
| 43 | 1 | 140-020-0054 | CONNECTOR SOCKET |
| 44 | 1 | 560-110-0101 | TERMINAL |
| 45 | 1 | 772-363-A | SHIELD CAN |
| 46 | 1 | 330-220-0049 | GASKET RING |
| 47 | 1 | 560-082-0007 | COVER BACK |
| 48 | 1 | 010-051-0007 | DOUBLE TAPE |
| 49 | 6 | 560-110-0100 | TERMINAL |
| 50 | 1 | 650-200-0004 | SUB PCB |
| 51 | 2 | 560-090-0072 | BRACKET |
| 52 | 2 | 600-788 | (+)MACHINE SCREW (PH) |
| 53 | 4 | 330-220-0037 | GASKET RING |
| 54 | 4 | 330-110-0130 | (+)MACHINE SCREW (PH) |
| 55 | 1 | NOT AVAILABLE | FCC NO LABEL |
| 56 | 1 | NOT AVAILABLE | NAME LABEL |
| 57 | 1 | SEE NOTE 2 | BATTERY PACK |
| 58 | 1 | 550-070-0021 | BELT CLIP |